Letter to the Editor

Cement Has Been Slandered

Sir: The author of the article, "Sugar —Commodity? Ingredient?" appearing in the June issue, may know his sugar but he certainly does not know his cement. After criticizing sugar buyers at great length for lack of understanding, he implies that cement is purchased in just such manner. It would seem that there were no standards of quality applicable to cement, according to our bacteriologist. That is the implication I wish to correct.

Cement, as all the scientifically minded must know, is a complex chemical product produced by trained men who must analyze the raw materials and know how to mix them properly. Every step in the processing of limestone and shale or slag into cement is controlled with exactness. The chemical composition and physical properties of the finished product must meet rigid specifications. Even sand, which is a natural product, is definitely evaluated by fixed standards of fineness and purity. Sand and cement, too, must be considered ingredients in the mix, as it were, and just as surely as with the uses of sugar, their quality is responsible for success or failure.

THOS. S. JONES,
Chemist,
114 East Third St.,
Wellington, Kan.

June 8, 1933

◆

COMING FEATURES

New Banana Products

Production Planning in a Flour Mill

Converting a Low-Capacity Unit to Higher Capacity

Changing a Medicinal to a Food Product

Corn Milling

Onion Powder Manufacture

Laboratory Control of Production

Ideas of Practical Men

Canning in Russia

New Ideas in Dried Fruit Packages

Enzymic Juice Clarification

FOOD INDUSTRIES

PRODUCTION : ENGINEERING : DISTRIBUTION

LAURENCE V. BURTON, *Editor*

M. A. WILLIAMSON, *Publishing Director*

Contents for July, 1933

VOLUME 5 NUMBER 7

Mr. Belcher Meant Well, But— 243
BY WALTER H. GRIMES

Dirty Process Steam—What Can Be Done About It? 246
BY S. H. COLEMAN

Taking the Guesswork Out of "Cast" Confectionery Drying 248
BY OTTO WINDT

Trading Gum for Empties Brought Back the Bottles 251

Ultra-Violet Irradiation Stimulates Yeast Activity 252
BY WM. L. OWEN

Ridding Tomato Pulp of Black Spots and Grit 254
BY C. M. AMBLER

Developing Organization and Procedure Under Farm Relief Act 255

Things Are Different in South America 256

"Before a Price-Fixing Spree, What About Our Costs"—A Macaroni Man Protests 258
BY E. J. McLUCKIE

Home-Made Machine Fills Paper Cups With Frozen Mix ... 259
BY BILLIE BURGAN

Many Problems Beset Vegetable Oil Producers 260
BY W. R. WOOLRICH AND E. L. CARPENTER

Fourteen Months—and 21 Letters—to Sell a $50 Change Part 262

Where Do We Belong—Under N.I.R.A. or A.A.A.? 263

Proposed New Food and Drugs Act Embodies Fundamental Changes 265

Saving Money in Buying and Using Motor Truck Fuels and Lubricants 268

Accident Prevention Boosts Sales 2½ Million Units 272

Editorials	241	**News**	278
Ideas of Practical Men	273	**Men, Jobs and Companies**	282
New Books	274	**Business Trends**	284
Current Literature	275	**New Equipment**	286
New Products	276	**Manufacturers' Catalogs**	287

Copyright, 1933, by McGraw-Hill Publishing Co., Inc.

Contents indexed monthly in the Industrial Arts Index

Published monthly, $2 per year. Foreign, $3 or 15 shillings. Canada (including Canadian duty), $2.50. 25 cents per copy. Entered as second-class matter April 30, 1929, at the Post Office, New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A. Cable address "McGrawHill, N. Y." Member A.B.C.

McGraw-Hill Publishing Company, Inc., 330 W. 42d St., New York, N. Y.

Branch Offices: 520 North Michigan Ave., Chicago; 883 Mission St., San Francisco; Aldwych House, Aldwych, London, W. C. 2; Washington; Philadelphia; Cleveland; Detroit; St. Louis; Boston; Greenville, S. C.

James H. McGraw, Chairman of the Board; Malcolm Muir, President; James H. McGraw, Jr., Vice-President and Treasurer; Mason Britton, Vice-President; Edgar Kobak, Vice-President; H. C. Parmelee, Vice-President; Harold W. McGraw, Vice-President; B. R. Putnam, Secretary

One Pneumatic machine handles this variety of sizes and shapes of containers for the Mifflin Chemical Corporation of Philadelphia. The photo below shows the Ballard and Ballard Company range of package sizes handled on one Pneumatic Machine in their plant in Louisville.

. . . WET

PACKAGING FLEXIBILITY

DRY. . . . .

Automatic Packaging flexibility is worth real money to manufacturers today. Ability to meet new packaging trends with existing equipment and without costly changes or additional investment is an invaluable business asset in these changeable times.

That is why when you invest in Pneumatic Packaging Machinery today, you are quite likely insuring a saving of money some time in the future. All Pneumatic Machines for the handling of either wet or dry free flowing products are designed to offer you the absolute maximum of flexibility. This is one of the outstanding characteristics of the Pneumatic line of automatic packaging machines, and a feature that has proved its value in the plants of some of the country's most famous manufacturers in the last few years.

Wet or dry—there is a Pneumatic machine to handle your production with the speed and flexibility to meet present and future needs. Write for more complete information.

PNEUMATIC MACHINES

Carton Feeders—Bottom Sealers—Lining Machines—Weighing Machines (Net and Gross)—Top Sealers—Wrapping Machines (Tight and Wax)—Capping Machines—Labeling Machines—Vacuum Filling Machines (for liquids or semi-liquids)—Automatic Capping Machines—Automatic Cap Feeding Machines—Tea Ball Machines

PNEUMATIC SCALE
PACKAGING MACHINERY

PNEUMATIC SCALE CORPORATION, LTD., 72 NEWPORT AVE.
QUINCY, MASS. (NORFOLK DOWNS STATION)

Branch Offices in New York, 117 Liberty St.; Chicago, 360 North Michigan Ave.; San Francisco, 320 Market St.; Melbourne, Victoria; Sidney, N. S. W. and Trafalgar House No. 9 Whitehall, London, England

FOOD INDUSTRIES

Volume 5 Established 1928—McGraw-Hill Publishing Company, Inc. Number 7

PRODUCTION • ENGINEERING • DISTRIBUTION

NEW YORK, JULY, 1933

•

Laurence V. Burton, Editor

At the Crossroads

AMERICA stands at the crossroads today, but the normal simile stops right there. Ordinary procedure would be to choose one path or the other, yet our policy as a nation seems to be to attempt to move along two divergent roads at the same time.

• The ordinary man is hopelessly confused by the events of the day. Even the better informed find it difficult to unravel the snarl in which we find ourselves. Being somewhat less gifted ourselves than the gentlemen of the so-called "Brain Trust," we believe it is only fair to call on them to explain what end they hope to attain by their attempt to lead the country up two separate roads at the same time.

• What are the roads? Where do they go?

• The first is the road to increased foreign trade—a road which everybody agrees will be a great help to everyone in the country. There are certain obstacles to foreign trade, such as tariff, limitations on the total amount that may be imported, wildly fluctuating money which makes it extremely difficult for a foreign trader to know what a price quotation will really mean in terms of the money of his own country. One avowed policy of our government is toward the lowering of these barriers. Foreign trade would help us a whole lot, but lower tariff would eventually mean lower prices.

• Now let us look at the other of these two roads. This is the road leading to economic nationalism—to use a big-sounding phrase. This is the road which will lead us to higher prices, and everybody wants higher prices. So Congress has passed laws which will lead to higher prices, including the Farm Relief Act and the Industrial Recovery Act. If these laws actually accomplish any of the things for which they were designed, prices will be put up.

• And if prices go up, then imports will start to come into the country. And if prices go very high, a flood of imports will come into the country. Congress, or the administration, or both, is aware of it, and so they have arranged to give the President power to prevent imports coming in and spoiling our plans for higher prices.

• One road leads to increased imports and exports. The other leads to diminished imports and exports. Our government is trying to go both ways at once. Secretary of State Hull has been in London pleading with 66 nations of the world for lower tariff and a resumption of international trade. At home we are planning to raise prices, to protect which we must keep out exports from other nations.

• Plainly we cannot do both things at the same time. We cannot go up both roads simultaneously. We cannot have at once both high tariffs and low tariffs, or restricted production and unrestricted imports. It just won't work. Either one policy or the other must be followed. We as a nation must choose one road or the other. We cannot go both ways at once.

• America can go up the road to economic isolation and higher prices, or she can go up the other road to volume of foreign trade and lower prices (at least for the time). But America cannot do both at once. We must decide which it shall be, and until a decision is reached, we will not get very far from the crossroads in any direction.

• For this reason FOOD INDUSTRIES warns its readers that until the government adopts a consistent policy, sticks to a single course of action, and abandons one or the other of these opposing policies the confusion will remain.

AS IT LOOKS TO US

Our New Deal . . .

Not to be outdone by the administration and the gentlemen of the "brain trust," we have decided to give our readers, and (modestly speaking) ourselves, a new deal. We refused to await some association's action but went right out and got FOOD INDUSTRIES a new suit of clothes.

If the gentlemen in Washington still persist in their social experimenting, we shall match their audacity with further adaptations to the changes of the day. We refuse to be anything but alert to the advantages of the new deal.

Diminishing Margins . . .

Gradually diminishing spread of prices between fancy and extra standard quality of canned vegetables is giving pause to many. Apparently there is a limit to the amount of best quality which the public can purchase at a marked increase over choice quality prices.

Despite this narrowing, the fact remains that public preference will continue to be in favor of fancy quality. In the future it is more likely that choice quality will have to compete for price with the next lower grade, rather than be expected to merge with fancy prices.

Surplus . . .

The surplus always sets the price. That is the portion of any commodity that nobody needs, few want, and is sold at a sacrifice. Yet surpluses are, or may be, identical in quality with the rest of the commodity.

Price . . .

When a perishable competes with a non-perishable, the perishable food usually sets the price—especially if it happens to be on consignment. And this is what is the matter with canning. Industry agreements cannot help.

Opportunity . . .

A pipe dream of many a person today is that the new laws, N.I.R.A. and A.A.A., will make it unnecessary to put forth any selling effort—that business will be allocated and come to a manufacturer through some form of government decree.

Anyone who deludes himself in the belief that this will happen will lose his business. Opportunity will not disappear. Only the cut-price sale will disappear.

Helpless . . .

It is strange how economics—that subject which is very tiresome to the ordinary mortal—intrudes itself into our very lives today. We try to thrust it aside, yet it is impossible. Recent legislation from Washington and the events in London are the most vitally significant forces in the life of every man. They cannot be avoided even if we would do so.

Help Wanted . . .

What can be done with peanut germs? One of our subscribers produces 200 lb. of peanut germs per month in the manufacture of peanut butter. He asks our aid in finding a more profitable use for these germs than using them for fertilizer. What are your ideas? Publishable practical ideas will be paid for.

Haste or Deliberation? . . .

With the government urging haste upon employers to submit codes of fair competition for approval, many find themselves in a serious quandary. Far-sighted men clearly see the amazing expanse of contingent problems arising, and are inclined to go slow. Yet the government has the power to *compel* action, so management has got to do something.

Our belief, if it interests you, is that there be deliberation before *submitting* a code. Yet any branch of industry should proceed at once to *adopt a tentative code* to be produced promptly when it is demanded. This will permit more time to dovetail its provisions with those of all other codes of groups whose activities touch, and will minimize the trips to Washington as well as their expense and discomfort in summer.

Crowding Doesn't Pay . . .

Every now and then a certain superintendent felt that the help needed a little crowding in order to keep up the production rate. But at no time did it work out that way, until he discovered why pushing the help slowed down the rate. Reason: Semi-finished goods made up too far ahead became sticky and would not flow easily. The remedy was easy.

Management in bread baking has a sales problem that parallels this production incident. Crowding sales by forcing too much bread onto retailers results in too many stale loaves. People consume less stale bread than fresh bread. The remedy also is easy.

Preservatives— Mostly the Bunk! . . .

As long as the human race continues to bear children, we suppose there will be a succession of those who seek new chemical preservatives for foods. And they will continue to clutter up scientific and technical literature with results of experiments that were doomed to produce valueless results from the very outset. Poe and Sehlmann, *Journal of Bacteriology,* May, 1933, tried out hexylresorcinol on meat, milk and tomatoes. They found that this substance is "not very effective in reducing the number of bacteria" in proteins, but that it caused a marked reduction of bacteria in acid foods such as the tomato.

Of course! But acid foods are so easily preserved by heat, by sugar, by salt or even in rare cases by the exclusion of oxygen, as in sauerkraut, that one more method is of no economic value, even if it were permitted by law or by one's conscience.

We recommend a careful study of the science of bacterial ecology, bacterial physiology and food preservation to all other investigators before beginning any more work of this nature.

. . . At that the two helpers on the pile began to guffaw—regular deep belly laughs . . .

Mr. Belcher Meant Well, *But*—

. . . Being a tale of disaster in the purchase of raw materials . . . Many a man has been burned in the same kind of a deal, but not everyone gets out as luckily . . .

By WALTER H. GRIMES

WELL, if there are any rummy tricks in the cheese business that haven't been tried out on me, I'd like to know what they are. Did I ever tell you about my first dose of bad medicine that they tried to make me like? No? It happened quite some years ago, just before I started the new St. Cecelia plant of the old Belcher company.

The boss was giving me my final instructions about where to bank, copies of the corporation bylaws and such stuff.

"And when you are buying cheese," he continued, "you had better have all your dealings with the Ratteigh folks. I happen to be a stockholder in that company and the Ratteigh boys have assured me that they will give you the best of advice and service. They tell me that it is very easy to get badly trimmed on cheese buying."

All of which was a pretty good reproduction of the sort of dope they themselves had been trying to hand to me a couple of days before, when Charlie Ratteigh and his sales manager had been trying to put the fear of God into me. I will confess that they had me sort of worried, for I didn't know a Flat from a Twin or a Cheddar. And Longhorns, Single Daisies, Double Daisies, Block Swiss and Wheel Swiss were just names that I think I had seen once or twice before in print.

Before I equipped our new plant, and started upon a new product, that we had never made before, the Big Boss had been making some pretty careful inquiries from his friends about raw materials. Of course, it was perfectly natural for him to do so, because, during almost all of his business life, it had been dinned into his ears by his father, who had started the company, that they made or lost money depending on how good guessers they were on which way the market would flop on their particular raw materials. So he just naturally fixed it up with the Ratteighs to steer me on cheese buying, and the first thing that they did was to try to scare me to death and show me how I could bust my employers if I made a single mistake.

Well, before they got through with me, I almost began to think that it was mighty lucky for me that Mr. Belcher was a stockholder in their outfit, so that I could be sure to get the inside advice on the cheese market. But I was younger then, and I hadn't learned that anyone who tries to frighten you usually has a mighty good reason and that you had better be looking for the aforesaid reason.

* * *

About five or six weeks later I was at the factory we had leased out in the Middle West in a small town where we were on two railroads. Lordy, what a job it was to get things going! We had three gangs of pipe fitters and two millwright gangs, to say nothing of carpenters, electricians and handy men. The worst of it was that there was only one man on the job that could read a blueprint, outside of myself. And, on top of that, one machinery house sent us the blueprint of the base of a machine we had ordered, but after we got the concrete all poured, with the base bolts in place, we got a wire saying that it was the wrong drawing. The right one came the next day and called for foundation bolts about 4 in. farther apart.

Here was a new foundation about 3 ft. high that held about 3 tons of concrete and was full of old pipe and

rods for reinforcing—you know how farmer help around the factory always loves to reinforce concrete—and there was nothing to do but put two huskies on the job with mauls and pound it to pieces.

A chap walked into the office one afternoon and handed me a card that said he was chief chemist of Ratteighs. To tell the truth, I had not given much thought to cheese of late, so I said: "So you are the baby that knows all about cheese, eh?"

He sort of smirked out of the corner of his mouth and came back with this one: "If there is anything I don't know about cheese, nobody knows it!"

Can you beat it? Can you even approximate it?

So we went up into the laboratory, where we had a few boxes of cheese and a young fellow carrying on a few experiments on our formula, and I got another dose of the fear stuff from the chief chemist. Under the pretext of helping me, he gave me a lot of high-sounding phrases that he said I ought to include in my purchase orders when I was specifying the right kind of goods. He used terms that I have never heard used before or since, like "No short-bodied cheese," and I can imagine the big horse laugh that must have greeted my first purchase order at Ratteighs'. But Mr. Belcher had told me that the Ratteighs were going to give me special service, so I copied down the hot air that the chief chemist spilled.

* * *

Finally we got the place going, slowly at first, for you have to remember that we were making a new product that no one in the company had much knowledge about, let alone me. Sometimes it almost seemed like the blind leading the blind. We would run a half day and then tear half the place down and rebuild it differently. After a week or so we could run all day without some kind of a jam or breakdown, and since the quality seemed to be O.K., I decided it was time to begin to see where we were on costs and also where we would be on supplies if we really got into steady production.

For my first good-sized purchases of cheese I thought it was best to go to the city to see Ratteighs' Western branch. Here they gave me the same old works I got in the Eastern city, but this time they took me to a cold-storage warehouse and seemingly tried to prove to me that I was an absolute idiot on cheese. Every time I plugged a cheese with a trier and liked it, it was always something extra special with a price that was out of sight. Finally, I managed to pick out 400 boxes of Cheddars from nine different lot numbers, at a price which they told me was "a special low price" for a new customer, but which seemed to me to be pretty steep at 34 cents a pound. (It makes me laugh these days to think of cheese at 34 cents.) I objected to their type of quotation, which said, "Box weights for net," for this meant that whatever figure was stamped on the outside of the box of cheese was to be the figure billed to me regardless of how much moisture had evaporated from the cheese. The bulk cheese sales manager was most condescending—"Custom of the trade, you know," and you have to remember that what I didn't know about cheese then was nothing short of amazing.

Well, hadn't Mr. Belcher told me to do what they advised? So after a little impolite cussing, I gave shipping instructions for 200 boxes and left for home. The other 200 were to come when I ordered them shipped. Our local cold-storage plant near the factory had room for only about 300 boxes at a time. The whole lot of 400 boxes was invoiced to us and paid for within ten days without discount, which is another custom of the cheese trade. But it is not a bad idea at that.

Later I ordered the other 200 boxes shipped in. When they arrived they were very badly needed and I told the boys to start in using them right away, because they were all from the same lots of cheese as what we were using. Next morning, at our daily tasting party, the product had a funny off-flavor, only it wasn't funny to me. This was quickly traced to the new cheese. A rapid check-up showed that all of the new cheese had lot numbers that were entirely different from those in my memorandum book, which I wrote down at the time I purchased the 400 boxes. Worse yet, every bit of it had a flavor like laundry soap, and the color was mottled and faded out in spots.

We were all ignoramuses on cheese in those days, but we learned later that soapy cheese was nothing but rancid cheese. (I'll tell you about some of the tricks in curing cheese some other time.)

Just then our local truckman pulled up at the door and yelled: "Where do you want this cheese?"

"What cheese?"

"A hundred and fifty boxes came in this afternoon from the local. I was up at the Grand Trunk and I got half of it here on my truck."

"Well, what in the devil is the meaning of this?" I thought.

In a few minutes the office girl came out with a special delivery letter from the Ratteighs, signed by the manager of the bulk cheese department. This is what it said:

"Our chief chemist has been studying your cheese requirements and has recommended that you blend the cheese which you have received on your shipping order No. C-104 with another lot of 150 boxes which we have taken the liberty of forwarding to you. The price will be the same as that of our previous lot. Our invoice for $2,895.60 is attached."

. . . Either I get my money back or it will be the last fast one you will ever put over, so help me Hannah . . .

We sampled the new lot that came without an order, and it was perfect but the other stuff was worthless from our viewpoint and I almost believe that it was worthless from any viewpoint.

Boy! Was I mad?

What sort of explanation could I make for the loss of about $1,000 worth of goods in process? What was I going to do with the remaining 190 boxes of the soapy cheese which had been paid for as good cheese, but had been substituted with some punk stuff? Of course, I had the new lot of 150 boxes in my possession, and that was something.

Right there I decided that the Ratteighs and I were through forever regardless of whatever Mr. Belcher might think. A bunch of low-lives and scoundrels they were. They would take that cheese back and reimburse us for the loss or they would eat the damned stuff!

Back to the city on the night train I went. But first I went to see some

other cheese houses, although this was contrary to instructions from the head of the works. The first place I went to was the Blank & Blank Co. The manager was a youngish sort of chap, about my age and very decent. Said he thought he had just what I wanted, some nice sharp-cured Cheddars, two years old next month. After putting on frocks which he had in his office, we grabbed a couple of triers and went into the cold-storage warehouse just around the corner, where he kept all of his merchandise.

A running fire of remarks kept coming from Mr. Blank all the way over to the warehouse. He hadn't known we were using cheese. He hoped we would develop a very pleasant relationship. Their firm, a very old one, had always been sticklers for quality. Business had been a little slack of late. Prices would undoubtedly be most attractive to us, particularly on an initial order.

In the warehouse, two men pulled down and opened up box after box from the big pile. I couldn't find what I wanted. These cheeses were all light-colored Cheddars and Twins. Mr. Blank looked perplexed.

"Really, Mr. Grimes, you can't expect to find better sharp-cured cheese than these. They simply do not exist."

Still I was undecided.

"Perhaps you could give me a better idea of just what you want," he continued.

"Well, I would like to see some cheese that is so old that it is black with age," said I.

At that the two helpers on the pile began to guffaw—regular old-fashioned deep-belly laughs.

"That will be all from you men," snapped Mr. Blank. And then turning to me, he said very apologetically: "I must ask your pardon for the behavior of my employees. I am a little afraid that someone has been tricking you with one of the oldest stunts in the cheese game, painting the cheese with lamp-black in paraffin to make it look old."

I looked up at the two men on the pile just in time to see them turn quickly away and try to stifle another horse laugh. Every cheese from Ratteighs' was black!

* * *

After ordering about 400 more boxes of the prettiest cheese you ever saw at 29½ cents instead of 34 cents, actual net weight to prevail, I went over to Ratteighs' with a firm determination to commit murder if I did not get satisfaction. That big brass gate and the old man at the reception desk were nearly knocked over as I hot-footed it down the row of offices in their headquarters to find the bulk cheese sales manager. By good luck I found him alone. He eyed me suspiciously, for they liked to have all visitors announced in the proper way.

As soon as I told him my name and firm he began a long diplomatic explanation about the whole affair without another word from me. As soon as he got far enough along to convince me of his own guilty conscience, I cut him off.

"Mr. X," I interrupted, "I have come up here to ask you to take that whole lot of soapy cheese back, and to reimburse us for it and for the losses we have incurred through the substitution of bum cheese for the good lot that we bought and paid for, and that you stole from us."

"Mr. Grimes," he exploded, "frankly I don't like your attitude or the tone of voice you are using. If there are any differences of opinion that are based on fact, we can settle them. Now just what is wrong?"

"You switched lots of cheese on me and you are going to take them back and honor my invoice for $1,500 for spoiled goods!"

"If we have sold you anything that is not satisfactory or exactly as we represented it to be," said he, "you may return it for full credit. But as for spoiled goods, I cannot see that it is our responsibility——"

"You can't? Well, I'll show you——"

"You'll show me what?"

He was beginning to get hot under the collar. The compliments began to fly and I got my chair far enough away from his desk so that it would not be in my way when I started something.

"Now get this straight, Mr. X. You pulled a fast one. The fact that you sent an extra 150 boxes of cheese proves that you had a guilty conscience, for you backed it up with that special delivery letter telling me to blend it with that junk you switched on me. Do I get reimbursed or don't I?"

"Really," Mr. Grimes, I don't see how you can expect us to be responsible for your manufacturing methods."

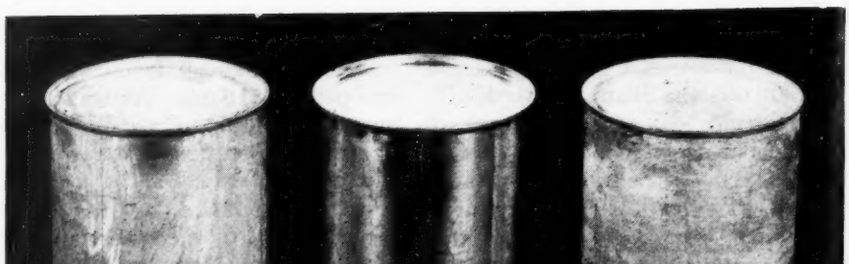
"All right, X; either I get the money back or I'm coming around this desk, and it will be the last one you will ever put over on anybody, so help me Hannah," and I started around after him.

Nothing seemed to be quite so desirable at that moment as to get my thumbs on his Adam's apple and shove hard. He must have been frightened, for he gave in before I could get half way around his desk, and right there and then he agreed to everything that I demanded. I made him put it in writing.

* * *

"Well, now, Mr. Grimes, now that we have settled this little misunderstanding to your *entire satisfaction,* I hope we may continue to serve you. Mr. Belcher, your president, is one of our good friends, and he has asked me to be especially careful of your business, etc., etc., etc.," clear to the front door.

Dirty Process Steam . . . . What Can Be Done About It?



One of the troubles that come from dirty steam is whitening and etching of cans. Steam that will do this to cans will not help the flavor at all if it is used directly in a food.

By S. H. COLEMAN

FOR many years the problem of dirty steam has been one of major importance. This condition is the result of priming or foaming of the water in the boilers and has been the cause of serious operating difficulties wherever encountered. The most important of these difficulties are the whitening and etching of cans while processing with steam in retorts, the introduction of impurities into the product where heating is accomplished by direct admission of steam, and the danger, high maintenance cost and lowered efficiency due to water hammer, erosion and incrustation of valves, piping and prime movers.

Prevention and control of boiler-water carry-over, or excessive moisture in steam, has been the subject of extensive research in the last few years. The principal factors influencing this trouble have been determined and methods of control have been evolved. These methods have been used with remarkable success in the larger steam-generating plants of the canning industry, with the result that most of the difficulties experienced in the past have been eliminated.

The causes of carry-over from boilers may be subdivided into a number of heads. As enumerated below, these are:

1. Design of boiler equipment.
2. Character of load.
3. Method of operation.
4. Proper blow-down procedure and control.

The first two items may be eliminated in this discussion, as they are characteristic of each individual installation and cannot be changed without excessive expenditure. However, attention to the last two items will greatly improve conditions in all plants.

The method of operation of a boiler has a distinct bearing on its tendency to prime or foam. Due to the seasonal nature of canning, it is the practice to install boiler plants which are too small to supply the steam demand without excessive forcing. With boilers working under these conditions, every precaution must be taken to prevent any undue variation in the boiler water level, and to avoid any operating practice which will cause the steam-liberating surface of the water in the drum or drums to be unduly turbulent. The water level should be kept as low as is consistent with safety under the operating conditions. But with hand control of the water feed it is almost impossible to maintain a constant water level in the boilers, and at times the water in the drums becomes excessively high, with the result that carry-over is unavoidable. The installation of feed water regulators usually is justified in that the human factor is eliminated and a constant water level is assured.

The tendency to operate a boiler so that the steam pressure fluctuates excessively with the load demand is a practice which should be avoided as far as possible. Sudden reductions of pressure cause excessive turbulence of the water in the drums. This action is the result of the sudden flashing of water into steam, causing a rapid acceleration of circulation with a resulting bumping effect in the drum. The obvious remedy for this condition is to carry a steam pressure as nearly constant as possible and to handle boilers at all times so that no sudden drop of pressure will occur. To eliminate further the human factor, the installation of some form of combustion control is recommended, consisting either of damper regulators in the case of hand-fired boilers, or of complete combustion control systems where coal is mechanically fired or where oil or gas is the fuel. These systems, applied so as to maintain as nearly as possible a constant relationship between heat liberation in the furnace and heat liberation in the boiler, will, in most cases, eliminate all trouble from this source. In addition, the investment will be justified by the saving of fuel as a result of their installation.

Mr. Coleman is chief engineer of a large food manufacturing plant.—EDITOR.

Proper blow-down procedure is essential if priming and foaming are to be avoided. As it is necessary to treat the boiler water to avoid scale formation, the accumulation of dissolved and suspended solids within a boiler is unavoidable. There is a definite limit for every installation to which the concentrations of these solids may be carried without danger of carry-over. This limit is proportional to the character of the impurities in the water, load conditions and general operation. To hold this concentration within safe limits, blow-down must be properly controlled. It is better to remove these solids by blowing down than to have the boiler perform this operation through its steam discharge nozzle. Control of blow-down can be accomplished through chemical tests of the boiler water or through the use of specially designed hydrometers. No set schedule is possible, however, for any installation, because the amount of blow-down must be proportional to the load demand on the boilers and feed water conditions generally.

It is important also that the concentration of solids in the boiler water be held within reasonable limits to avoid an excess of alkalinity in any water which might be carried over with the steam. When water is treated to prevent the formation of scale, either by external softening equipment or the introduction of softening chemicals directly into the boiler, there should always be an excess of alkalinity to avoid corrosion of the boiler. This alkalinity usually is present in the form of some alkaline sodium salt. These salts under boiler conditions usually break down to form sodium hydroxide or caustic soda. These are the alkaline substances which cause the etching or removal of tin from the cans in cooking retorts. The white precipitate which is often found on cans is composed of insoluble calcium and magnesium carbonates, which are precipitated in the boiler in the form of suspended matter. If concentration of these substances is held at a low point and carry-over does occur, the phenomena of whitening or etching will be much less severe than if high concentrations are carried.

Control of boiler water is one of the most important problems experienced in the usual plant and is the cause of serious trouble if neglected or improperly handled. The indiscriminate use of boiler compounds is to be avoided. For every water or boiler installation there is a definite method of treatment which will give the proper protection against troubles from this source. It is recommended that an experienced boiler-water chemist be consulted before determining the method of treatment. Realizing the needs of the small plant, a number of companies specializing in water treatment have established systems by which boiler water can be properly controlled under the supervision of expert water-treatment engineers and chemists. By means of simple test kits which can be used by the ordinary boiler operator and a system by which the results of these tests can be sent to the laboratory for check and advice by experienced chemists, the scientific control of boiler water is made possible at a reasonable cost to the smallest plants.

Oil, if present in boiler-feed water, is often a serious cause of carry-over. If oil is present in the natural water supply through pollution, some method of filtering this water before use should be employed. If oil is present through contamination from the cylinders of engines, pumps or hoists, oil separators should be installed before the exhaust steam from these units is used in the direct heating of boiler-feed water. In this instance, trouble is sometimes experienced from oil which is vaporized to such an extent that the average separator will not remove it. This usually is the result of using low-grade cylinder oils. The obvious method of eliminating the condition is the use of high-grade oils.

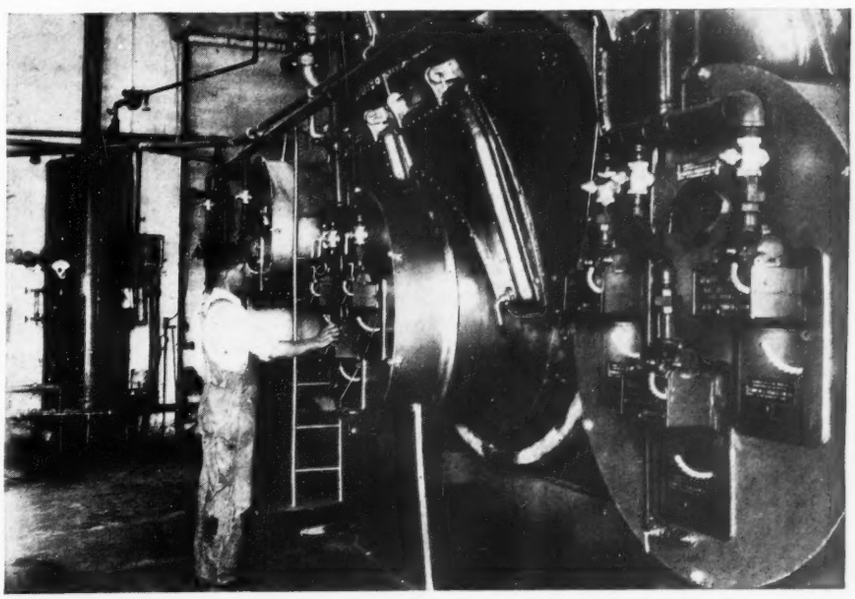
When all of the factors enumerated above have been checked and eliminated as far as possible, if carry-over is still experienced, the installation of steam separators or purifiers is advisable. This equipment, operating on the principle of reversal of flow, or of centrifugal action, separates the entrained moisture from the steam. These purifiers usually are installed either internally or externally at the boiler and are very efficient in eliminating entrained moisture. In any case, separators should be installed in the steam lines at the points where direct admission of the steam into the product is employed.

Proper drainage of the cooking retorts will eliminate in a large part the whitening and etching of cans. If traps are installed on the bottom of the retort, they should be kept in perfect working order to avoid an excessive accumulation of condensate.

Where traps are not installed, the retorts should be thoroughly purged of condensate after the cooking of each batch is completed. If this procedure is diligently attended to by the operator, a large part of the difficulty from carry-over can be avoided. Proper grading and drainage of steam lines leading from the boiler to the process will help, so that slugs of water will not be allowed to accumulate where they will be pulled over at the first increase in load.

If attention is given to all of the points enumerated, carry-over can be eliminated or reduced to a point which is negligible in the majority of cases where it has caused trouble.

In many plants where the operation is seasonal the tendency is to install boiler plants too small to supply the steam demand without excessive forcing.



Taking the Guesswork Out of "Cast" Confectionery Drying

By OTTO WINDT
Research Chemist and Assistant Superintendent
Farley Confections, Inc.
Chicago, Ill.

Systematic loading, temperature equalization and humidity control in drying room and effective conditioning of drying starch avoid most difficulties

In the June issue of FOOD INDUSTRIES Otto Windt discussed the unit operation of dehydration by absorption as exemplified in the manufacture of cast confections. In this article he continues with the drying room operation and takes up the methods of starch cleaning and conditioning.—EDITOR.

THE results obtainable through efficient 24-hour operation will quickly pay for the additional installation and operating costs incurred. A few of the advantages that result are: reduction in drying time, a more uniform product, reduction in number of starch boards required due to quicker "turn-over," closed adherence to production schedules, and in certain cases release of valuable floor space, "tied up" by drying rooms, for more productive uses.

The accompanying graph (Chart I) will forcefully illustrate the hourly temperature variation in a drying room that was heated only during the period of plant operation.

Another phase of drying-room operation that is often neglected is *temperature equalization* throughout the drying space. It is surprising how many manufacturing confectioners wonder at the lack of uniformity of their products when they neglect to provide proper facilities for maintenance of uniform temperatures. It is a simple matter to determine the temperature gradient in a drying room. But how many manufacturers know the temperatures at various heights in their drying kilns? They should realize that uniform merchandise cannot possibly be produced unless temperature uniformity is maintained.

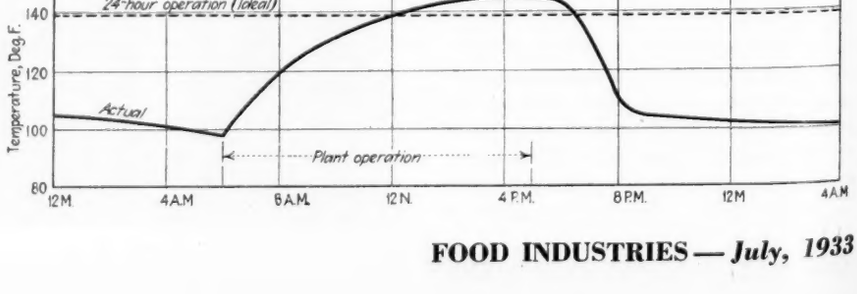
A specific condition that illustrates this point actually existed in the drying rooms of a large candy plant which came to our attention a few years ago. The relationship of the drying-room temperatures at various levels and the corresponding moisture content of the molding starch stored in this room just prior to the deposition of confectionery centers is shown in Table I.

How could uniform results be obtained under these conditions? The answer is very simple—"they were not." One can say that approximately one-third of each batch of the candies deposited in this starch and then, if necessary, stored in this drying chamber, was dried to the proper moisture content. One-third retained an excess of moisture, which usually leads to "sweating," or syneresis, in the case of starch "jelly" candies, or to possible fermentation in the case of "cream" centers or the usual type of marshmallows deposited in starch pre-dried under these conditions and to be chocolate-coated. The remaining third of the batch was dried to too low a moisture content,

Table I—Temperature-Moisture Relation in Starch Room

Height From Floor	Temperature of Air and Starch Deg. F.	Moisture Content of Starch Per Cent
1 Ft.	102	8.1
4 Ft.	115	7.1
7 Ft.	130	5.6

CHART 1- DRYING ROOM TEMPERATURE VARIATION



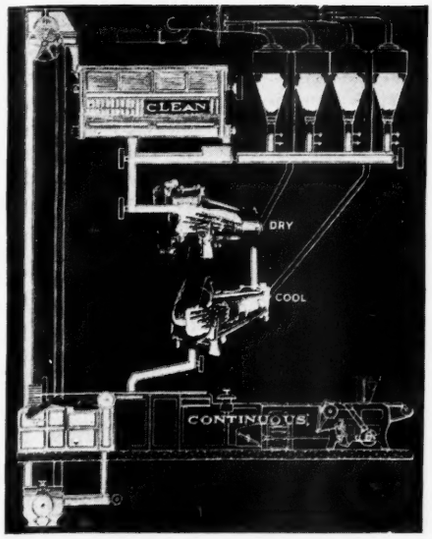


Fig. 1—In the directly heated and cooled system the starch is conditioned before and after passing through a cleaner between runs through the mogul.

thereby sacrificing proper "eating qualities," or texture.

Drying-room temperatures must be equalized. In small chambers the proper location of intake and exhaust ducts probably will suffice, although the installation of a small blower or fan is recommended for positive circulation. For large chambers it is essential that blowers of the necessary capacities be installed to produce uniform temperatures and to give efficient circulation between the starch boards. Attention to this point and to the adoption of the proper corrective measures, whenever necessary, will quickly repay the candy manufacturer.

Also the important factor of optimum *relative humidity* in drying chambers usually is ignored by the confectionery manufacturer, although the reason for maintenance of proper relative humidity for each case of confectionery dehydration is readily apparent.

Before closing our discussion of drying rooms it may be well to comment briefly on their "loading." Factors aside from those already discussed and aside from differences in batch composition that will influence the rate of drying under any given set of conditions of temperature and relative humidity are the distance between stacks, the free space between boards, and the rate and efficiency of air circulation. Adherence to a definite system in "loading" will be found advantageous to insure uniform dehydration. Also the drying room should be loaded with freshly cast goods only as the properly dehydrated material is withdrawn. In this connection we wish to emphasize the suggestion that whenever possible drying rooms should be provided with recording thermometers and should be thermostatically controlled.

There should be little hesitancy on the part of the confectionery manufacturer to install equipment which has proved of inestimable value to other food manufacturers. The initial investment usually is considered the major obstacle. It must, however, be borne in mind that *quality control depends on process control.* Also it is equally true that *without quality control, consumer demand for any product will rapidly approach the vanishing point.*

Although highly satisfactory results can be obtained by the intelligent use of the "drying-room" method for starch dehydration, there are various excellent automatic and continuous drying systems available for the progressive manufacturer. They fall into two general classifications according to methods of heating: directly or indirectly heated. The greatest obstacles to more universal adoption of these systems by the smaller confectioners are the comparatively high equipment and installation costs. Manufacturers who are really interested in increasing production and elevating quality standards will find themselves well repaid if they thoroughly investigate the various systems being offered as especially fitted to fulfill their requirements. The advantages of these systems are readily apparent.

The efficiency of one type dryer is indicated by the data in Table II on partial dehydration of molding starch in a typical installation.

In a popular system using the direct-heated drying method, the starch, after the candy has been removed, is passed through a long, inclined, rotating cylinder (Fig. 2). The starch is heated as it tumbles through the drying chamber by passing between numerous staggered, stationary, square steam pipes. The surfaces of these heated pipes are continuously scraped free of adhering starch by suitable scraping devices to prevent scorching. At the lower end, directly opposite the starch-discharge opening is a vent for moisture removal. This moisture outlet is connected to a suction fan and dust collectors. When using this type of dryer it is especially advisable to keep the starch to a high degree of cleanliness. Candy tailings or strings, invariably present to a greater or lesser extent, will tend to caramelize when coming in contact with the hot pipe surfaces. This will result in premature darkening of the molding starch together with an impairment of molding and dehydrating properties.

The other system of continuous starch drying can be termed a "hot-air" drying system. By this method (Figs. 3 and 4) the starch does not come in contact with the heating surfaces, but is dried by the action of preheated air. This system is not quite as compact as the first one mentioned, but its advantage lies in the non-scorching feature due to the indirect heating method.

As stated previously, these continuous methods are admirably suited for mass production. Their use greatly reduces the number of starch trays necessary, because the manufacturer can deposit in the same starch from which the dried confections are being removed. With the entire stock of starch "in cast" it is apparent that the drying-room space can be decreased materially. In fact, in the production of certain confections, such as tender starch jellies or "gum" drops, drying chambers can be eliminated entirely. The dryers are provided with recording thermometers and are thermostatically controlled. In this way great uniformity of drying conditions is maintained.

Another phase of proper "condition-

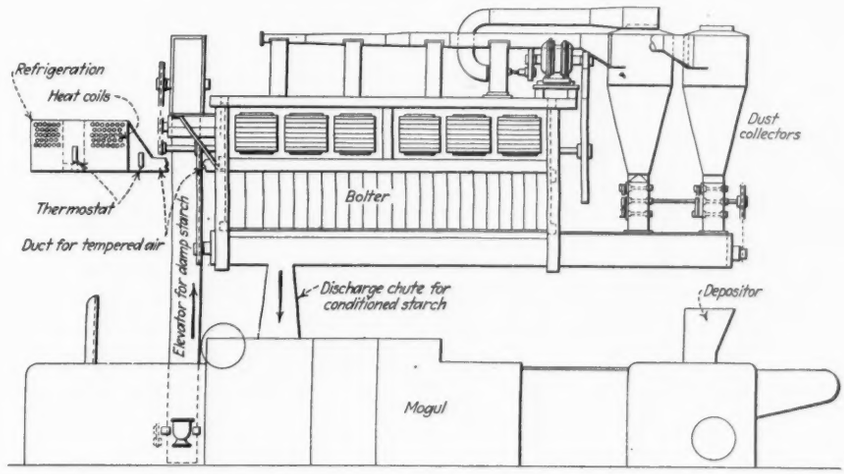


Fig. 2—A current of tempered air drawn through this type of indirectly heated system dries the starch while it is being cleaned.

Table II—Moisture Content of Molding Starch

Before Passage Through Dryer Per Cent Water	After Passage Through Dryer Per Cent Water
7.43	4.90
7.05	4.64

ing" is the maintenance of the optimum molding starch temperature prior to the "casting" of the confections. Proper starch temperature depends on the type of candies being made. For confections of the "gum" drop type, hot and dry starch are the ideal conditions. The starch as it leaves the heating and drying unit usually has a temperature of 170-175 deg. F. and a moisture content of 4.5 to 5.5 per cent. For other classes of confections, such as marshmallows, "cream" centers, "cast" fudges, and pectin jellies, this temperature is far too high. In these cases the starch must be cooled to the proper temperature after the drying operation. The optimum "casting" temperature for marshmallow is between 100 and 105 deg. F. Illustrated in Figs. 2 and 3 are two types of equipment available for thermostatically controlled drying and cooling of confectioners' molding starch.

The term "conditioning," as applied to molding starch, however, cannot be confined to defining proper dehydration and temperature maintenance. Molding starch is correctly conditioned only when it is free from foreign particles, such as candy "tailings," tiny wood splinters, and the like. The intermittent screening method employed most generally by confectioners is one that is far from satisfactory. As a rule, periodic cleaning of starch by careful sieving through fine-mesh reel bolters, gyratory sieves, or vibrating sieves should be practiced. The required frequency of screening for removal of non-starch particles is dependent on the number of times the starch has been in use and on the nature of the confections which have been deposited in it. The only set rule regarding the necessity for cleaning is: Take the time to do this too-often neglected operation. *Do not continuously postpone it.* The oftener it is done the better will be the quality of the confections and the longer will be the "life" of the starch.

The ideal arrangement for starch screening is the installation of automatic reels, or vibrating and oscillating sieves which are directly connected with the mogul. The latter sieving equipment is made in single-, double-, and triple-deck types and is very compact and efficient. Satisfactory results have been obtained on molding starch with a single-deck machine of the required capacity fitted with a screen of 30-mesh. After the properly dried confections are removed from the starch by the brushing operation the starch is screened before being replaced in the trays.

The ideal starch "conditioning" system is one that is completely unified and that properly synchronizes and controls the cleaning, the moisture content, and the temperature of the molding starch. Systems that fulfill these requirements are either available or can be readily assembled by the enterprising and progressive confectionery manufacturer. As a general rule, it is recommended that the screening operation precede the drying operation, especially when direct-heating type dryers (Fig. 2) are used. The statement that "it will well repay the manufacturer to install the proper conditioning equipment" cannot express forcefully enough the actual results. The improved quality of the products and the production economies achieved through the use of automatic conditioning equipment will speak for themselves. In short, the production of quality confections which requires the use of starch for controlled dehydration is made immeasurably easier and far more economical through the application of modern equipment.

In time, molding starch acquires the following detrimental features: impairment of dehydrating and molding properties, progressive darkening in color, and objectionable taste and odor development due to flavor absorption from the deposited centers. The manufacturer can readily determine when replacement is necessary.

Disposal of the discarded molding starch is a problem that is not solved very easily or satisfactorily. It is not advisable to use this starch in the manufacture of confections. In certain instances the starch manufacturer will make a very small allowance towards the purchase price of fresh starch. It has also been suggested that other outlets could be developed which would be more profitable to the candy manufacturer. One specific instance that we recall is the disposal of a few tens of thousands of pounds of discarded starch, which had been carefully sifted to remove all candy "tailings" and splinters, to a large foundry supply firm. The starch was repacked and sold as "special foundry starch" and was used successfully for core making. Other possible outlets are in the manufacture of adhesives and explosives.

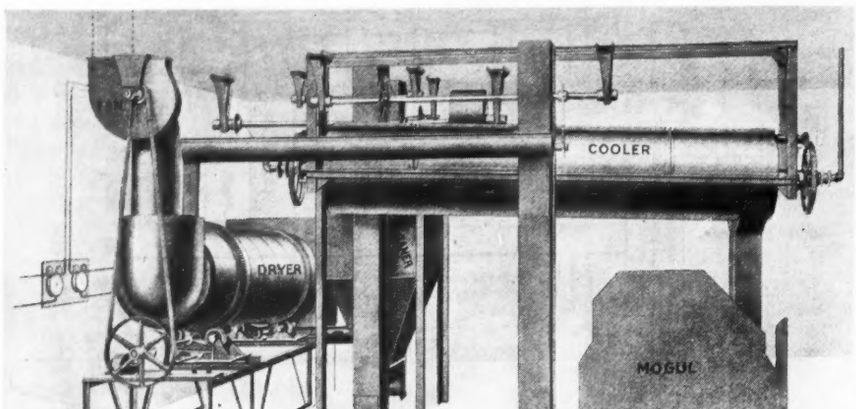
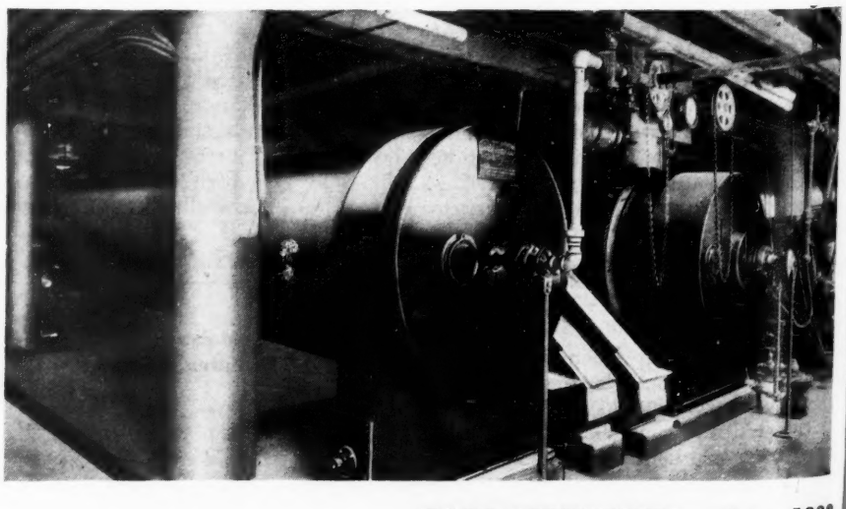


Fig. 3—Heated air passing through the revolving drum of another type of indirectly heated system dries the starch before it is cleaned. In a separate drum the starch is cooled before being used.

Fig. 4—Hot or cold starch may be fed to either of two moguls by the directly heated and cooled system of the Louisville Drying Machinery Co. in the St. Joseph (Mo.) plant of the Chase Candy Co.



When the children found that an empty milk bottle was good for a stick of chewing gum . . . bottle returns jumped from 40 to 967 in one day!

Trading GUM for EMPTIES

Brought Back the Bottles

THESE YOUNG GENTLEMEN are in the act of trading an empty milk bottle for a piece of chewing gum. The bottle is placed on a hook something like that which you find on your telephone, and the lever which he holds in his left hand is then pushed to the right. This deposits the bottle inside the bottle saver. Then when he pushes the lever back again into the left position, a stick of chewing gum will be delivered where the young man on the left has his hand ready to get it.

WHEN the first bottle saver was put into a store in Buffalo by Sparks' Dairy, they didn't give any publicity to the move. But there it stood, 5½ ft. tall and 2 ft. in diameter, bearing an invitation to bring back an empty milk bottle and trade it for a stick of chewing gum.

Did the kids in Buffalo fall for the idea? Did they! Just look at the figures and let your imagination supply the picture of the near-riot that ensued. Ordinarily bottle returns at this store, where no deposit is required, were from 35 to 40 per day.

Then the bottle saver was put in, and without a bit of publicity, young Buffalo caught the idea and by nightfall the astonishing total of 967 bottles had been turned in. In the first four days the word spread among the children so rapidly that 3,382 bottles were traded for chewing gum in a single store. They came from fields, from cellars, from attics. Several bottles bore the name of a milk dealer who had been out of business for ten years!

Of course, not all of the bottles which the children brought in were the property of the Sparks Dairy. The children didn't care whose bottles they were, as long as they could be traded for chewing gum.

In a comparative test on five stores, first for six days without a bottle saver, and then for six days more with the bottle saver in service, the following results were obtained:

	Without Bottle Saver	With Bottle Saver	Increase
Bottles Sold	895	1013	154
Bottles Returned	456	*1434	978

From this experience it has been calculated by John J. Horan, president of Sparks' Dairy, that the cost of getting the bottle back, including the token, is less than half the amount of the normal bottle loss. The device, which is adaptable for beverage bottles and can dispense candy as well as chewing gum, holds 60 bottles, and is serviced by the route salesman who supplies the store with milk. He takes the milk to the refrigerator, refills the case with empties from the bottle saver, refills the gum chamber and is gone. Meanwhile the children are scouring the town for more empties. Dirty bottles are out of sight, the storekeeper is not bothered, and he doesn't have to collect or refund bottle deposits, and milk sales for Sparks' Dairy are considerably increased.

And other dairies are wondering how to meet this competition and prevent the children from taking their own bottles over to Sparks' bottle saver.

Ultra-Violet Irradiation Stimulates Yeast Activity

By WM. L. OWEN
Consulting Bacteriologist
Baton Rouge, La.

EVIDENCE indicating a beneficial effect of ultra-violet rays upon the fermenting action of yeast induced the writer to ascertain the effect of this treatment on baker's yeast and to determine its influence upon the rate of leavening of bread dough.

Previous studies by bacteriologists and biochemists on the action of short-wave-length rays upon yeast resulted in a number of apparently conflicting conclusions. Some of these investigators, such as Fazi[1], have found that yeasts are stimulated by short exposures to ultra-violet rays, while others, such as Feuer and Tanner[2], have found that yeasts differ from bacteria in their resistance to the action of ultra-violet rays only in degree and were not accelerated by short exposure to it. More recently, Owen and Mobley[3] have shown that the fermentation of molasses wort by yeast is greatly accelerated by short exposure to ultra-violet rays and that the final efficiency of fermentation also is increased perceptibly by it.

At the outset of our studies with baker's yeast, we felt that there might be three or four influences exerted by the exposure of the yeast to this treatment, such as: the possibility of a selective action whereby some of the weaker yeast cells might be eliminated; a purifying influence resulting from the destruction of bacteria with which the yeast might be infected; a direct stimulating effect upon the yeasts themselves; and an action upon the ingredients of the dough rendering them more assimilable by the yeast.

In our investigations the procedure was similar in most respects to that used in our studies on the activation of yeast in the fermentation of molasses wort. Preliminary tests were made on the activation of yeast in sugar solution by short exposure to a light from a carbon lamp of the National Carbon Co., which is rich in light waves of from 2300 to 3100 Angström units. In these tests 100 c.c. of a 5 per cent cane sugar solution containing 7 grams of compressed yeast, which was thoroughly kneaded and mixed into a uniform suspension in the solution, was poured into a shallow porcelain pan and exposed to the action of ultra-violet rays for varying periods of time. The suspension was then poured into a 500 c.c. Florence flask and placed in a water bath at 30 deg. C. The flask in turn was connected to a burette filled with and inverted in water saturated with CO_2 and the gas of fermentation was measured by the displacement of water in the burette as described in Matthews' "Alcoholic Fermentation," p. 273. Precautions were taken to put the treated yeast into the flask for testing immediately after treatment and to carry on the tests, so that, except for the exposure to ultra-violet rays, the treated and the control series were identical.

From the data given in Table I, it can be seen that ultra-violet treatment of yeast results in an accelerating fermentation which can be graphically illustrated as in Charts 1 and 2. In Chart 1, a comparison is shown between the treated and untreated yeasts, as regards their comparative rate of gas production from the beginning of the fermentation period until it is about one-half completed. The greatest difference in the effect of the treatment is after one hour, although even from the beginning the treated yeast gives rise to a more uniform fermentation than the untreated yeast. One of the characteristics of the treated yeast is the elimination of the secondary lag in the period of from 15 to 30 minutes after the test is started. The sustained action of the treated, as compared with the untreated, yeast is shown in

Table I—Gas Produced by Treated and Untreated Baker's Yeast at 30 Deg. C.

Yeast Treated 30 Sec. Elapsed Time, Min.	Gas Produced, C.C.	Burette Number or Cycle	Yeast Control Elapsed Time, Min.	Gas Produced, C.C.
5	4	1	6	11
10	9	1	11	17
15	19	1	16	27
20	23	1	26	50
25	30	1	31	64
35	78	1	36	79
39	100	1	39	99
44	138	2	44	122
49	152	2	49	151
54	197	2	57	198
Treated 10 Sec.			Control	
12	10	1	6	7
20	16	1	10	11
27	24	1	15	14
35	35	1	25	24
42	47	1	35	40
50	64	1	40	46
55	78	1	55	74
62	100	1	60	87
..	...	1	64	100
68	131	2	69	123
77	186.5	2	76	160
79	199	2	81	178
..	...	2	87	200
84	231	3	93	232
89	259	3	98	253
94	285	3	103	276
..	...	3	108	299
99	335	4	112	323
104	362	4	117	342
109	383	4	122	368
..	...	4	127	398
116	438	5	133	437
124	467.5	5	141	467
126	482	5	146	497

Chart No. 2, for the time required to complete seven cycles is plotted for the treated and untreated yeasts.

In this chart the greater sustained action of the treated yeast is evident and the divergence between the lines is greater toward the end of the fermentation period. Evidently the irradiation gives the cells a greater sustained activity than they would otherwise possess, and as the graphs are plotted from data obtained from a number of tests, they may be regarded as representative of this action.

It was logical that we should assume from these data that the ultra-violet treatment of baker's yeast might result in a smaller quantity of yeast producing the same leavening action in dough as would otherwise be obtained from the normal quantity of untreated yeast. To satisfy our curiosity on this point, another set of tests was run in which the quantity of yeast was reduced by 25 per cent, as compared with the tests previously made, and the treated yeast was exposed to ultra-violet rays for 10 seconds. The rate of fermentation of this reduced quantity of treated yeast was then compared with a standard quantity of an untreated yeast, with the result shown in Table II.

During the first cycle, we have a striking example of the accelerating effects of the rays on the yeast. For the three cycles there is a saving of 4 per cent in total time as well as a 25 per cent saving in the quantity of yeast used.

A study of the graphs given in Charts 1 and 2 reveals that there is a slight depressing effect caused by the ultra-violet rays on the yeast during the first few minutes after the exposure. This effect was not sufficient to classify the action under the general head of stimulation exercised by sublethal dosages of toxic substances, which has been studied so thoroughly by Hune,[4] Koch,[5] Fred[6] and others. Owen and Mobley[3] observed an increase in the number of cells and of the rate of budding of yeast exposed to the action of ultra-violet rays for short periods.

To test the effect of long exposures upon the initial rate of growth and fermentation activity by the yeast, some experiments were carried out in which the yeasts were exposed 30 seconds. The results are given in Table III. From these data it is evident that the exposure for 30 seconds had a depressing action upon the yeast during the first cycle, but that a greater fermentation was obtained during the second cycle. Being convinced by these preliminary tests that the fermentation rate of yeast could be so stimulated by the action of ultra-violet rays that the quantity of yeast required to produce a definite quantity of gas in a given time could be materially reduced, we proceeded with experiments to determine if this acceleration would hold true for the leavening action of yeast in bread making.

Table II—Gas Produced by Untreated Yeast and by 25 Per Cent Less of Treated Yeast at 30 Deg. C.

5.25 Grams Yeast Treated 10 Sec. Elapsed Time, Min.	Gas Produced, C.C.	Burette Number or Cycle	7.0 Grams Yeast Control Elapsed Time, Min.	Gas Produced, C.C.
5	2	1	15	8
10	8	1	20	16
20	30	1	30	28
35	65	1	45	56.5
37	77	1	50	78
40	84	1	55	98
45	100	1	..	...
50	127	2	60	119
55	147	2	65	141
60	163.5	2	70	165
65	178	2	75	189
70	200	2	77	197
74	224	3	84	240
78	246	3	89	268
91	300	3	95	296

Table III—Effect of 30-sec. Treatment of Yeast Upon Initial Gas Production at 30 Deg. C.

Yeast Treated 30 Sec. Elapsed Time, Min.	Gas Produced, C.C.	Burette Number or Cycle	Yeast Control Elapsed Time, Min.	Gas Produced, C.C.
10	4	1	5	4
15	6	1	10	9
20	13	1	15	23
34	22	1	25	30
40	48	1	35	78
44	57	1	39	100
45	99	1	..	...
54	157	2	44	138
59	186	2	49	152
63	199	2	54	197

Table IV—Time of Proofing Dough Made With Treated and Untreated Yeast at 35 Deg. C.

Yeast Used and Amount	Time for First Proof, Min.	Time for Second Proof, Min.	Total Proof Time, Min.
Untreated, 11.8 grams..	65	50	115
Treated 10 sec., 24 per cent less.....	70	45	115
Treated 10 sec., 24 per cent less.....	75	30	105

The dough formula used comprised:

	Grams		Grams
Flour.....	360	Milk.....	16
Water.....	216	Lard.....	16
Salt.....	7.2	Yeast food.....	1.8
Sugar.....	10.8	Yeast.....	11.8
Malt.....	5.4		

The yeast was kneaded into the water to form a uniform suspension, and the malt was then added. This yeast-malt suspension was exposed to the light for 10 seconds, as described in the previous part of this article. In the control dough, the yeast was added to the water and malt in the same manner, the only difference being that treatment with ultra-violet rays was omitted. The results of this test are shown in Table IV. In all cases the loaf made from the reduced quantity of treated yeast was equal to and in some cases superior to the

Chart 1—Treated yeasts have more uniform rate of fermentation activity, largely due to elimination of secondary lag period indicated between 15 and 30 minutes of fermentation time.

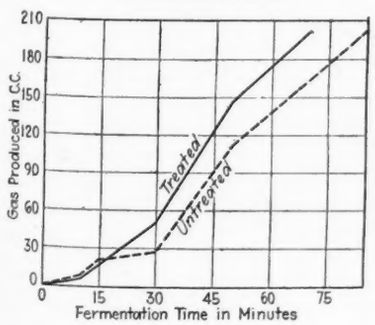
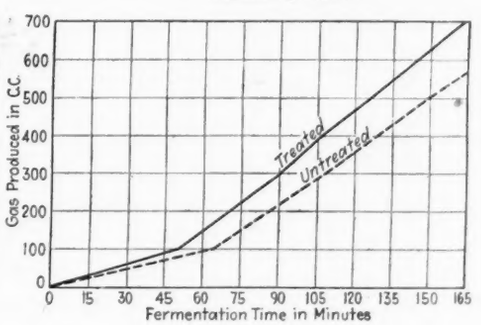


Chart 2—Data from a large number of tests giving results typical of the yeast action represent treated yeasts to have a greater sustained fermentation activity than untreated yeasts.



standard loaf made with the full quantity of untreated yeast.

From the results of these tests we conclude that a baker's yeast, given a limited exposure to the action of ultra-violet rays falling between the limits of 2,300-3,100 Angström units, has a definite acceleration and a greater sustained fermentation activity than untreated yeast of the same origin; also that as a result of this greater sustained fermentation activity, irradiated yeast is capable of producing a greater leavening effect than untreated yeast and, as a consequence, the quantity of yeast required to produce the normal rate of fermentation can be reduced by 24 per cent, and, finally, that the leavening effect of irradiated yeast upon the proofing time for bread dough shows that the quantity of yeast required can be reduced by 24 per cent with an actual saving of time in the majority of the experimental tests made.

REFERENCES

[1]Fazi, R., "The Action of Ultra-Violet Light on Saccharomycetes." *Journal Industrial and Engineering Chemistry*, Vol. 13, p. 265 (1921).

[2]Feuer, B., and Tanner F. W., "The Action of Ultra-Violet Light on Yeast-like Fungi," *Botanical Gazette*, Vol. 75, No. 3 (1923).

[3]Owen, W. L., and Mobley, R. L., *Centralblatt für Bakteriologie* (pending publication).

[4]Huhne, H., "Die Begunstigende Reizwirkung Kleinster Mengen von Bakteriengiften auf die Bakterien Vermehrung." *Centralblatt für Bakteriologie*, Abt. 1, Bd. 48 (1909), 135.

[5]Koch, Alfred, "Uber die Wirkung von Aether und Scwefelkehlenstoff auf Hoherer und Niedere Planzen." *Centralblatt für Bakteriologie*, Abt.

[6]Fred, E. B., "Uber die Beschleunigung der Lebenstatigkeit Hoherer und Niedere Pflanzen Durch Kleine Giftmengen." *Centralblatt für Bakteriologie*, Abt. 11, Bd. 31.

Ridding Tomato Pulp Of Black Spots and Grit

By C. M. AMBLER

Chief Chemist, Sharples Specialty Co.
Philadelphia, Pa.

CLEAN tomato pulp can be obtained only by observing the most scrupulous care in the selection and processing of the tomatoes. In order to produce the highest grade of pulp, it is essential to start with fresh, ripe, unblemished tomatoes of good color and to make sure that they have been thoroughly cleaned. Crushing, screening and evaporating operations must be performed under careful and accurate control, and every effort must be made to prevent the introduction of foreign matter into the pulp during processing.

In spite of such precautions, tomato pulp not uncommonly contains black specks, bits of skin which have passed through the screens, and earth or grit, which, once caught in the crevices of the fruit, cannot be removed even by the most careful washing. Another frequent source of contamination is the residue which adheres to the steam coils in the evaporator after a previous run. As this dirt is deposited throughout the pulp, it is difficult to detect or to remove.

The usual method of preventing black specks from getting into the pulp is to give the cooking coils a vigorous scouring after each run. But, because this cleaning is not done with sufficient frequency or thoroughness, black specks get into the pulp.

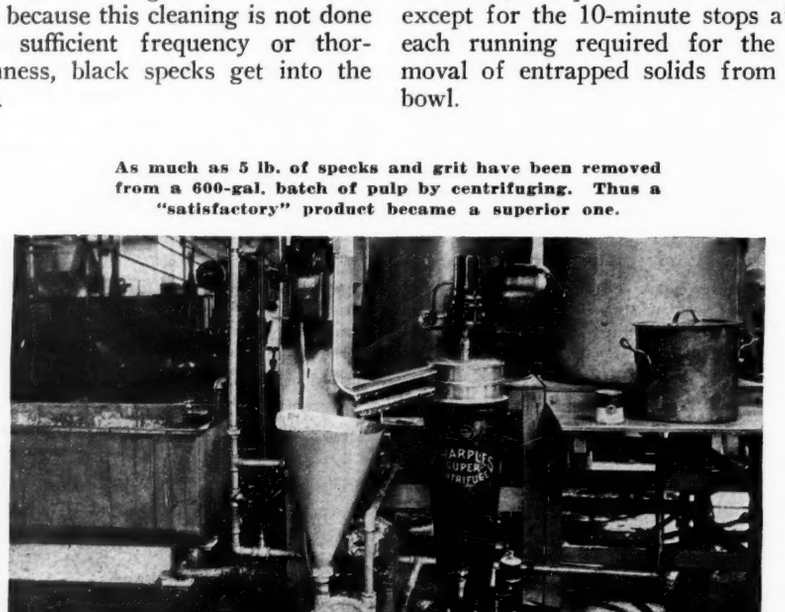
Several large packers have found that sending the concentrated pulp through a super centrifuge removes all the fine particles of dirt, grit, black specks, etc., and, as a result, yields a cleaner, smoother and more homogeneous product. Recorded instances show that as much as 5 lb. of objectionable material had been removed from a 600-gal. batch of pulp. Previous to centrifuging, the batch had been considered of satisfactory grade; but, after centrifugal cleaning, it was termed a superior product.

The centrifuge used for such work is necessarily constructed so that all parts which touch the tomato pulp are of Monel metal. The centrifuge should be fed by means of a displacement type pump capable of delivering 600 g.p.m.

The control and operation of the centrifuge are such that the bowl is filled with a bed of soft pulp at the beginning of the run. The foreign material and specks introduced into the bowl with the incoming pulp, being of relatively high specific gravity, embed themselves in the pulp layer already in the bowl, and so are trapped at the bowl wall, while the pulp discharges continuously through the cover spout.

After each separate running of the tomato pulp, the machine is cut off and the collected dirt removed from the bowl. The machine is then ready for another running. The super centrifuge is capable of purifying 500 gal. of tomato pulp per hour. As described, the process is continuous, except for the 10-minute stops after each running required for the removal of entrapped solids from the bowl.

As much as 5 lb. of specks and grit have been removed from a 600-gal. batch of pulp by centrifuging. Thus a "satisfactory" product became a superior one.



Developing Organization and Procedure

UNDER

FARM RELIEF ACT

SECRETARY WALLACE

FARM RELIEF measures affecting food industries are steadily taking form. Secretary Wallace named two capable administrators. George N. Peck, schooled in the war-time difficulties of price-fixing, comes from agricultural equipment merchandising, with both a practical background of business and understanding of government functioning in emergency.

Co-administrator is Charles J. Brand, first head of the U. S. Bureau of Markets, an agricultural economist of ability, practical from his experience in leading the National Fertilizer Association, of which he has been executive secretary for several years. Mr. Brand comes by the draft route, almost under compulsion, for a job in which he will try to reconcile government theories with the necessities of practical business. Under these leaders are a group of specialists, one for each of the major crop divisions, with Chester C. Davis, for many years active in Middle West agricultural organization, in general charge of the production phase of the program.

The food processing industries will contact principally with Gen. William I. Westervelt, of Chicago, director of processing and marketing. General Westervelt has been research director for Sears, Roebuck & Co. since 1927. His executive assistant is Carroll W. Dunning, of Portland, Ore. Mr. Dunning is a marketing specialist and has served in both the Department of Agriculture and Department of Commerce. He has been sales manager and assistant general manager of the Ford Motor Co. in Germany.

On food distribution problems, Gordon C. Corbaley, of New York City, is serving in an unofficial, advisory capacity. On the date that FOOD INDUSTRIES closed this report, Mr. Brand was giving consideration to the desirability of calling a preliminary conference of representative food trade leaders to consider distribution problems on which agreements will be sought.

Dictated by the necessities of the close relationship with the Agricultural Adjustment Administration, an all-industry food council may evolve ultimately. It will be an advisory agency, representing each major division of food manufacture, for consultation with the co-administrators and their staffs. Under this "grand council" there will be agencies representing each of the major food manufacturing industries.

One should not conclude from the emergency action taken in settling milk price wars and the armed strike in Wisconsin that such detailed handling of all future cases is to be expected. "These were skirmishes in which we met the enemy where we found him. Now we are taking time to organize a complete campaign." This is Mr. Brand's interpretation.

Types of Agreements

Three major types of industry agreements must be reached. These may take the form of actual contracts, or codes like those under the Industrial Recovery Act, or any other form suitable to the circumstances. They will relate to: (*a*) Prices for agricultural raw materials paid by industry; (*b*) wages, working conditions and hours of labor; (*c*) distribution practice, including prices at wholesale and retail.

Raising agricultural income from materials sold for processing comes first in this program. However, farm relief will be ineffective and of passing usefulness unless based on increased buying power of wage earners. Hence the second major arrangement will be to raise wages for plant workers. This means more money per week to the individual worker. It means fewer hours per week for the individual worker. It means more workers on the payroll. It means increased total payment for wages—more buying power for wage earners. Industry cannot escape all of these consequences.

Food manufacturers will naturally say, "How can we pay more for raw material and more for wages when we are today not making any profits?" The bill and the administration recognize this as a fair question, and they propose to answer it. The price to be charged for the product is to be increased. But, as in the case of industry control, they believe wages must go up first or the whole program will defeat itself.

But there are scamps in almost every trade and business. These scamps may, by the threat of official discipline, be scared into cooperation. If not, they will feel the licensing teeth of the bill. The procedure here is like that described for industrial control. Laggards will be first prodded into cooperation, if possible. If not, they will have their right to do business absolutely cut off, if necessary, as a last resort.

Industries are being urged not to rush to Washington with detailed complaints. Industry-wide presentation, carefully thought out, will get precedence over petty complaint.

One of the best known advertisements in South America is this poster. These figures, symbolic of a sandwich made from the vitamized cracker called Solvita, have been so dramatized by good advertising that they are frequently brought to life at costume balls or on the vaudeville stage.

Things ARE *Different In South America*

Both factory and sales management operate in ways that are a surprise to us

By S. RAGON
Buenos Aires, Argentina

SHAKING hands after every discussion between a superintendent and his foreman is an old Spanish custom in a well-managed plant in Buenos Aires. Whenever a superintendent stops to talk things over, his invariable way to close the conversation is to shake hands. And whenever anyone comes into pay or collect a bill, he always puts his hand through the wicket to grip the hand of the teller before he leaves the office. The punctilios of traditional Spanish courtesy are never omitted.

It has not been many years since girls first began to work in industrial establishments. The status of women in Argentina has always been seclusion in a strict home life under the careful chaperonage typical of the Latin peoples. So, when M. S. Bagley & Cia. first needed girls, their requirement was to create a high standard of social conduct in their plant and to maintain a personnel of reputation equaling the high reputation of the products of the company.

Where mothers are still doubtful, despite the eagerness of their daughters to enter Bagley's employment, the employment office has on file an unusually long list of applicants. The Bagleys have prestige. Those who are employed must contribute to that prestige as well as share it.

If any employee is so thoughtless as to use bad language of any kind, the penalty is a four-day suspension from work without pay. The offense is posted on the bulletin board together with the number of the unhappy employee. This procedure has a very far-reaching effect.

This firm was started by M. S. Bagley, who went as a boy to Buenos Aires from the United States back in 1850. Fourteen years later he was manufacturing *Hesperdina,* one of the oldest of the Argentine liqueurs. From this start his business has grown to a huge size, now manufacturing from five to ten million cookies, crackers and biscuits daily in 52 varieties. Although today it is controlled by British interests, it is still distinctively an Argentine industry.

Success has been the reward of this enterprise, exemplified by the long, winding marble steps leading up to the palatial-looking plant. All this contributes to the prestige of Bagley. So well has its reputation been built up, and so well has its slogan, *Siendo de Bagley es Bueno*—If it's Bagley it's good—been publicized, that it is not uncommon to hear the term Bagley used in ordinary conversation to mean *bueno*—good.

One feature of the plant is the battery of ultra-violet lamps placed on the dough mixers to confer a vitamin-D potency on the *Solvitas.* This practice, followed for the past two and a half years, is the basis for the trade-mark *Solvita,* from *sol* (sun) and *vita* (life).

Packaging of baked goods in Argentina has been a matter of combating an atmosphere of both high temperature and high humidity by the use of decorated tin containers which compare very favorably with the finest gift packages in the United States. The tins are lined with a combination liner of heavy wax paper and fancy crêpe paper.

Fruitilla biscuits are one of the most expensive pieces turned out in the plant. They consist of a solid

Bulk goods in 10-kilo (22-lb.) cans are largely for the school trade. The cans are returnable for refilling, but the volume of the business is very small.

The chief difference between this packing department and that of any large North American concern is the comparative absence of automatic packaging machinery.

Hand-packed assorted biscuits of the finest quality are the basis of Bagley's reputation.

biscuit spread with a fruit jam and covered with another piece in which the letter B is cut out. Several of these can be seen in the illustration of the hand-packed assortment. The letter B is imprinted in some manner on nearly every biscuit and cracker made by this company.

In addition to baked goods, Bagley's make jams, jellies, hard candies, mustard, vinegar, sauces and glacé fruit. They also make all their own containers except glassware. Machines for can making are of American make, but all baking and confectionery equipment is English.

Jobbers Take Only Credit Risk

The most unusual variation in their commercial practice from that of the United States is the selling plan employed. Ten years ago, when further market expansion for Bagleys seemed impossible because of the indifference and lack of cooperation of the wholesaler, an entirely new system of distribution was inaugurated. They began to sell to the retailer only, billing to a preferred list of wholesalers. Specialty salesmen now call on and deliver to every type of retail store, but only the jobber is billed. True, the manufacturer takes over the jobber's function of selling—at a somewhat increased cost—but he takes no credit risk; the jobber assumes only so much of the trouble.

In practice, the retailer's order is sent to his own wholesaler, who must approve the order before the merchandise is delivered to the retailer. Then the jobber becomes responsible for payment, and only those of good credit standing are served. Retailers all receive identical printed price lists, from which there are no concessions or differentials whatsoever to anyone.

For no effort at all, the wholesaler is offered a 5- or 6-per cent gross profit. His credit risk is estimated at 1½ per cent; his cost of handling collections is about 2 per cent; leaving a net profit of about 1½ per cent, which, in South America, is considered a fair return for business that costs no effort to get.

Wholesalers in Argentina were reluctant at first to accept this system of distribution, but it was the only way in which Bagley could expand. The plan is now general, and seems to be favorably accepted in the wholesale field.

Delivery by the manufacturer is made by motor truck within a radius of 50 miles of the various distributing centers throughout the country.

"Before a Price Fixing Spree— WHAT ABOUT OUR COSTS?"

. . . A Macaroni Man Protests

By E. J. McLUCKIE
Indiana, Pa.

FOR a number of years the National Macaroni Manufacturers' Association has been striving not only to effect the establishment of a uniform cost system throughout the industry but also to get the members to exchange cost information for the better regulation of a reasonable selling price. Neither of these objectives has been achieved to a great degree. Now it appears that what started as but a sublime idea is about to become a mandate of the "powers-that-be." For this reason, and before we jump into a price-fixing spree, it would seem to be wisdom to examine more thoroughly the validity of our cost-finding procedure.

In the first place, the association appears to be getting prepared to go to Washington to set a price, armed with a bundle of questionnaires. Now, anyone who has been doing much reading of modern research methods will immediately remember that of all the ineffective ways of arriving at a truth, the questionnaire is of least value. In the first place, data on a questionnaire are not primary data but are secondary data, and so thoroughly diluted with subjectivity as to be meaningless. One has only to reflect for a moment on the variety of conditions under which these questionnaires will be filled out. Some will be based on carefully gathered facts reflected by a perfectly kept and understood accounting system. Many others will be based on the kind of system that runs, "Well, we always figure our labor costs about so and so a box." Some others will be wilder, and still others will be downright untruthful.

We do not mean to accuse manufacturers of being crooked, but we have seen lots of questionnaires filled out, and we have not the slightest confidence that any price based on such a medium will be in the long run satisfactory to an industry, or will be the kind that will tend to command respect. But we do predict that a price arrived at in this manner will come ultimately into disrepute and be nothing but the source of subterfuge; more of what we are hoping to eliminate. It is possible that the exchange-of-figures idea has died for no other reason than that hard-headed men not only would place no confidence in such figures but could see no use in getting them so far as their own plants were concerned.

Shoot for Par

Having thus roughly handled the plans of the association, let us see what we can offer by way of a substitute idea. We need not look far for homely illustrations. In a rather scientific way, every golf course is assigned a "par" for the course. This is made up of a number of pars, one for each hole. Thus a standard, acknowledged by all and capable of being used as a measuring stick of one's efficiency, is established. But, note that it is not the average of a polyglot of efficiencies. It represents efficient achievement. How do we know that the average or representative of our questionnaires will not be an inefficient cost? Is the macaroni industry an efficient industry or do we simply assume that it is? Government or no government, it will be economic suicide to peg a price that will perpetuate ineffective management.

From this distance, it looks as if the government is going to be a "big-hearted mama" who is going to gather us all under the protection of her skirts, but this will prove a delusion. When she stepped in to save the banks, a number of them found themselves ordered to liquidate painlessly, but to liquidate, nevertheless. It is doubtful if she will save each and every member of any industry. There is a fly in the ointment. Beware of that fly!

It would be a wise move for the macaroni industry or any other industry to appear in Washington not armed with questionnaires but with scientific data scientifically arrived at by people recognized for their ability to gather such data—industrial engineers or recognized management authorities within the industry. To quote Harrington Emerson:

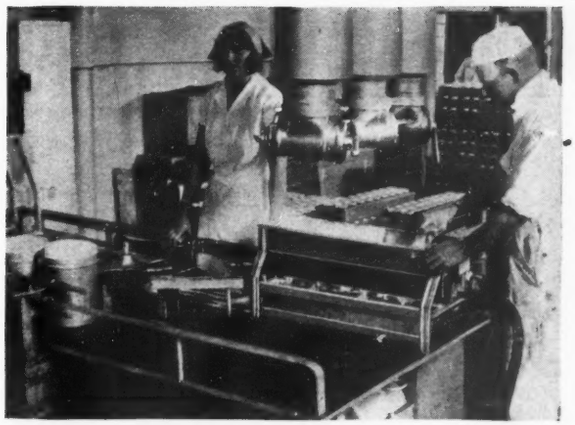
"There are two methods of arriving at costs; the first method, to arrive at them after the work is completed; the second method, to ascertain them before the work is undertaken. The objection to the first method . . . is that it is wholly incorrect, mixing up with costs incidents that do not have the remotest direct connection with them, so that analysis of cost statements does not lead to elimination of wastes. The advantages of the second method are that costs are finally tabulated that are the real costs divided as to each unit . . . An analysis of costs so stated facilitates an almost inexorable elimination of inefficient conditions of all kinds, standard expenses being constantly standardized at a new level; wastes, the excess above standard costs, being constantly removed."

Sound Costs Insure Markets

In conclusion, we maintain that arriving at costs to set a price is not a matter of opinion or of experience or practice of a group of individuals but it is a matter for scientific analysis by skilled experts in management who are capable of visualizing an ideal condition and of recognizing inefficiency and ineffective methods. Such a cost will be demonstrable, objectively arrived at. It will be free from lost motion and management eccentricities. It will be an economically sound cost that will insure a market for the product in a market that does not have to eat macaroni. It will insure value given for value received, and will insure at the same time the welfare of the industry.

HOW TO MAKE MACHINE TO FILL PAPER CUPS

By **BILLIE BURGAN**
San Diego, Calif.



Home-made filling machine, located over hardening-room conveyor. Hundreds of trays are kept standing by to preclude delay.

TO SPEED up production and cut packaging costs for its Chily Bears, Hage's, Ltd., San Diego, Calif., needed a machine to fill paper cups with frozen sweetened milk. Its solution was to put the "home talent" of its production force to work. The result is a filling machine that was made in a tin shop at little expense. And this machine has not only operated satisfactorily and at the high rate of 300 dozen Chily Bears an hour but it has performed so beautifully that the idea has been applied to packing brick ice cream.

This machine employs two rows of measuring cylinders, each cylinder containing enough mix to fill one paper cup. These measuring units are suspended from a receiving compartment into which the mix discharges from the freezer hoppers. Using a metal paddle, or spreading tin, the operator distributes the mix uniformly, and it flows through openings into the measuring cylinders, the surplus mix being gathered at one end of the spreading box, or receiver. The operator then pushes a handle which moves the bottom sections from under the cylinders, permitting the mix to flow into paper cups held in a tray below. To keep the partially frozen mix from sticking in the measuring cylinders, city water circulates around them.

In constructing the filling machine, the spreading box and measuring cylinders are made in one piece, of copper. The cylinders are $1\frac{7}{8}$ in. in diameter and $3\frac{7}{8}$ in. high, $\frac{1}{4}$ in. of their height extending below the water-jacket line. A false removable bottom with holes that line up with the measuring cylinders is installed in the receiver, providing a uniform surface for spreading. Sketch *E* in the accompanying drawing shows the bottom piece and gives the spacing of the cylinders. Sketches *A* and *B* show the machine assembled.

The sliding bottom arrangement is the trick mechanism of this home-made filler. Shown in sketch *C*, the two main sections are made of copper, $3\frac{1}{4}$x31 in., with $\frac{1}{4}$-in. lips. Each of these members serves a row of measuring cylinders, sliding sidewise to permit the cylinders to discharge their contents and moving back to close them again. The sliding motion is effected by guide slots cut at a 45-deg. angle. These slots, which are $\frac{9}{32}$x4 in., operate on guide bolts, $\frac{1}{4}$x1 in., double nutted and soldered to an operating track. Control members of $\frac{1}{8}$x8-in. galvanized metal, with holes 7 in. between centers and connected at one end with a hand grip, slide the bottom sections into the open and closed positions.

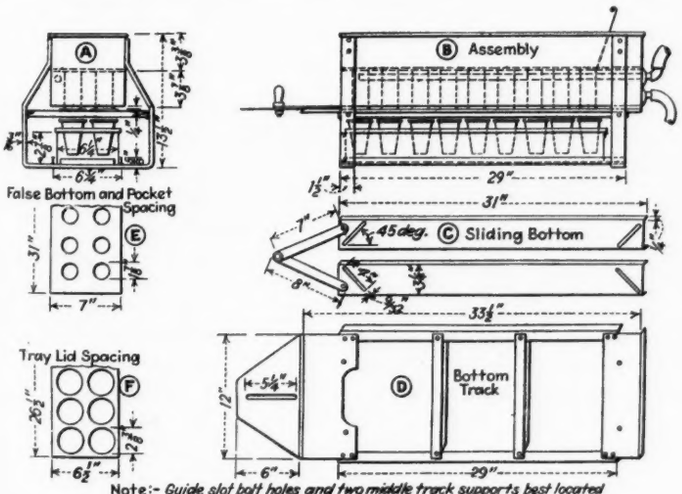
The operating track for the bottom sections, shown in sketch *D*, is of 14-gage galvanized sheet metal, broken and riveted together and riveted to the two main supports. Attached to the track is a sheet-metal guide with a $5\frac{1}{4}$-in. slot.

The trays which hold the paper cups are $6\frac{1}{4}$ in. wide, $26\frac{1}{2}$ in. long and $2\frac{7}{8}$ in. high, with a half dozen 2-in. holes in each side to permit air circulation while in the hardening room. The tray lids, which are $6\frac{1}{2}$x$26\frac{1}{2}$ in., have 18 holes, $2\frac{3}{8}$ in. diameter, to accommodate the cups. Six-ounce flared cups, $3\frac{3}{8}$ in. high, with a $2\frac{3}{4}$-in. top diameter and a $1\frac{3}{4}$-in. bottom diameter, are used.

To guide the tray to the proper position, a receiver is installed at the bottom of the machine. This is of 16-gage galvanized sheet metal, $6\frac{3}{4}$ in. wide and 29 in. long with $\frac{5}{8}$-in. lips. A stop, $\frac{5}{8}$x1x6 in., of $\frac{1}{8}$-in. material, is riveted to the tray receiver $26\frac{1}{2}$ in. from the receiving end.

The main supports for the filler are $\frac{3}{16}$x$1\frac{1}{2}$ in., of galvanized stock. Rivets attach them to the spreader box and to the track for the sliding bottoms. The sheet of metal used for spreading the mix is $6\frac{7}{8}$ in. wide and 7 in. high, with a rolled edge.

As revamped to package brick ice cream, pint size, the machine is equipped with square measuring compartments.



Note:- *Guide slot bolt holes and two middle track supports best located by setting members in position.*

Many Problems Beset Vegetable Oil Producers

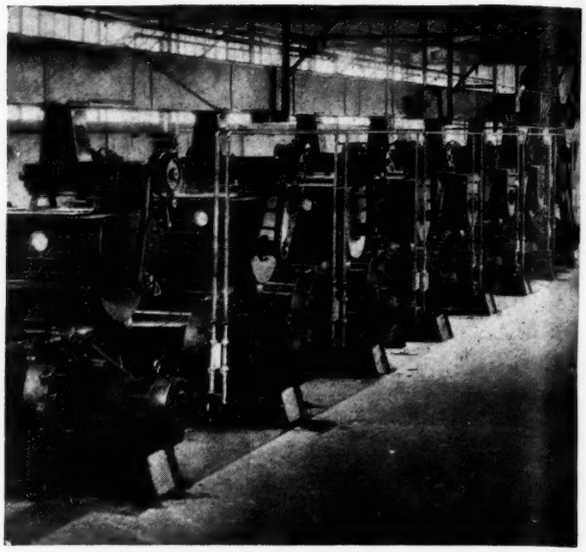


Fig. 1—Cake produced by expellers does not require "breaking" preliminary to grinding.

Demand for low-fat, high-protein meal redirects attention to increased oil yield from cotton seeds

By W. R. WOOLRICH
Professor, Mechanical Engineering
and
E. L. CARPENTER
Assistant Professor, Mechanical Engineering
University of Tennessee
Knoxville, Tenn.

COTTON seeds represent only one of several sources of refined edible vegetable oils produced in the United States. Yet in 1932 they accounted for more than 1⅓ billion pounds of refined oil in a total production of 1¾ billion pounds. Such production totals have not been attained without solving numerous problems in cleaning or separation of the oil-bearing seeds, in tempering or conditioning the meats, and in freeing the oil.

Hydraulic pressing, expelling by pressure expellers, solvent extraction, and releasing the oil by bacterial fermentation are four available methods for commercial production of these oils. In the case of American cottonseed oil, almost 100 per cent of the production is separated by mechanical pressing or expelling methods. This is remarkable when one considers that even the best mechanical separation methods recover only 85 per cent of the available oil, as compared with a 95-per cent recovery by solvent extraction. Explanation lies in that the mechanical details of chemical and fermentation methods have never been sufficiently developed to attract American oil millers.

The advantages to be gained by a more complete removal of the oil are a meal with better keeping qualities, a higher yield of oil with no additional milling cost, and a high protein meal which is palatable and nutritious. Being almost starch-free, this meal, in flour form, is suitable for human consumption, particularly when a balanced diet is needed.

Failure to get high oil recovery and good quality of meal is charged to many causes. The principal one is lack of careful study and research on methods of conditioning, rolling and cooking the meats. Control methods for more than 100 years have been rule-of-thumb, with little or no knowledge of the fundamentals of correct processing.

Probably the most important operation in the preparation for cooking is the rolling. In the cottonseed oil industry, upright rolls (Fig. 2) are used and the feed is from the top. Cant boards and roll scrapers direct the seeds through succeeding pairs of rolls rotating toward each other so that as the seeds pass through the rolls they are progressively crushed by the combined weight of the rolls above. This method of rolling results in a gradual reduction in particle size in a single unit with each succeeding pass.

For several generations, it has been a generally accepted theory that rolling actually crushed the oil cell to set free the oil. However, several scores of rolled specimens examined under the microscope indicate that a cell is seldom ruptured in the rolling process. Even when the meats have passed through a second series of rolls, there is no evidence of a general breaking down of the cell structure. Grinding to a very fine mesh has been substituted for rolling in some plants, but never with any uniform acceptance. Experiments indicate that the present rolling methods give oil yields equivalent to grinding even when the meats are ground to pass through a 50-mesh sieve. Microscopic examination indicates that the grinding operation is no more successful in breaking the oil cells than is the rolling. As a result, the real function of rolling appears to be that it exposes a greater area of the oil-bearing cells to the moisture and heat in the cooking operation.

After the meats have been rolled to a given fineness, the tempering with moisture, or what the oil miller terms "humidifying," must be performed. In commercial practice the meats are conditioned to contain about 12 per cent moisture when entering the cooker. When and how this moisture should be added and just what its function might be is a

*Abstract of a paper presented before the process industries group of the American Society of Mechanical Engineers at Chicago, June 29, 1933, under the title of "Factors, and Problems in Conditioning, Cooking and Pressing Cottonseed Meats."

debated question. One school expresses the opinion that the moisture should be added in the seed house before the seeds leave the storage bins. A second group proposes that the moisture be added just after hulling and prior to rolling. But the general practice is to add the water just before the meats enter the cooker or in the cooker itself.

Experiments by the authors indicate that if this moisture is added just before cooking and the seed is brought up to 210 deg. F. with steam, the time required in the cooker itself can be reduced to a fraction of the present schedule. To obtain a uniform product, the steam used should be free from water when it enters the conditioning apparatus.

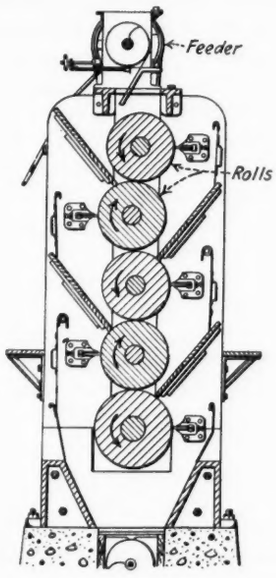


Fig. 2—The upright type of "five-rolls" used in cottonseed industry feed from the top and discharge onto a screw conveyor at bottom.

Much research has convinced the authors that the cooking operation has several functions. Primarily it is a drying-out process, and for that reason the moisture addition should precede the cooking. An early belief that cooking aided by making the oil "more limpid" is only partly true. Of course, the oil does have its viscosity lowered, but it is not going to run out unless the cell wall permits. If the meats are properly processed the cell walls become more porous and give a better outlet for the oil. Under certain conditions the cell wall appears to disintegrate in the presence of moisture. Also, if the cells are heated rapidly to 230 deg. F. after the moisture treatment, the steam generated within the cell ruptures its walls and permits the oil to escape. During the cooking the proteins coagulate and later aid in filtering at the presses.

The cooking is done in large steam-jacketed kettles (Fig. 3) subdivided into tiers three to six chambers high. Each chamber, charged through the top, is connected with the one below by an opening fitted with a gate so that at desired intervals the charge in a chamber may be dropped to the chamber below for further cooking or to be conveyed to the presses. The side walls of and the partitions between the chambers are steam-jacketed so that the heating of the meats is by direct contact with the walls and bottom of the cooker and by transfer of heat through the meats. A serious complication is the high insulating properties of the meats, which prevent a rapid heat transfer through the meats unless they are agitated. A pair of power-driven sweeps in each chamber aid in discharging besides agitating the meats.

The effectiveness of these sweeps, as now designed, is a subject of further study. Tests conducted by the Engineering Experiment Station of the University of Tennessee show that without agitation the heat transfer from the jacket wall at 210 deg. F. through 1 in. of meats is quite slow. After 30 minutes, the temperature had risen from 80 to 158 deg. F.; at 6 in. from the side wall the temperature was only 82 deg. F.

With proper agitation, studies indicate that a cooking period of 10 to 20 minutes suffices if the meats are kept at 230 deg. F. In commercial practice the meats are cooked from one to two hours at that temperature, and even then microscopic examination of the finished meal reveals some cells to be unbroken. At temperatures above 230 deg. F., the oil darkens, yet many plants speed up cooking by maintaining a wall temperature of 287 deg. F. Such practice is not recommended.

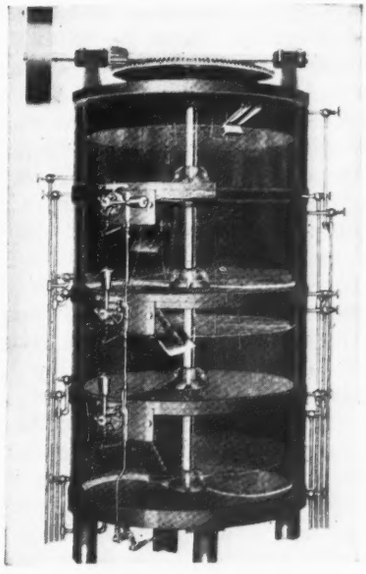
One method suggested to improve cooking is to condition the meats with dry steam and raise their temperature to 210 deg. F. in the tempering process. The subsequent cooking will require relatively a small amount of heat to rupture and dry the meat cells. In the second suggested method the meats are charged into the first chamber of the cooker with the proper amount of moisture at room temperature and effectively agitated to raise the temperature to 220 or 230 deg. F. All that is required of the remaining chambers is to hold that temperature sufficiently long to coagulate the proteins. By either method the total time involved probably would be much less than required in present practice.

The use of rotary continuous cookers has not proved satisfactory under the present variable procedure of conditioning the meats. Under the influence of unequally distributed moisture the meats ball up, are only partially cooked, and stick to the walls of the cooker. It is possible that with positive control of the conditioning of the meats, rotary cookers could be successfully used. Their heat transfer is rapid. Tests show that by their use the cooking time can be reduced to ten minutes if proper procedure be followed.

From the standpoint of crude-oil production and refining loss a moisture content of 12 per cent, based on total weight of meats, is generally accepted as optimum. Our studies indicate that this figure probably is low. But consideration must be given to the probable increase in refining loss if the moisture content is made too high. Using a continuous cooker and a special conditioning chamber, tests are being made by us to determine the best moisture content.

The preliminary milling operations in an expeller mill are identical with those in a hydraulic-press plant. The meats are hulled, coarse ground and dried to about 3 per cent moisture for uniformity. In a horizontal tempering conveyor the meats are slightly heated and enough water is added to lubricate their passage through the expeller. A vertical solid worm

Fig. 3—Compartment steam-jacketed cookers can be made almost continuous in operation.



feeder forces the meats into the horizontal pressing cylinder equipped with intermittent worms of progressively small pitch on a single shaft. As the meats are forced by these worms along the inside of the slotted, cylindrical working barrel toward the restricted openings at the discharge end, an increasing amount of pressure forces the crude oil out through the slotted openings. The spent cake is discharged through adjustable openings which control the thickness of the cake and, in that way, the pressure exerted on the meats. Under proper supervision an expeller will handle from 10 to 15 tons of meats in a 24-hour day.

Trends for the future indicate that the manufacturer of cottonseed oil and meal may choose between the mechanical and the chemical method.

In the mechanical methods the major unsolved problem is that of getting a higher oil yield with an increased meal value by better control and processing methods.

Likewise, in the solvent extraction method the major unsolved problems are mechanical rather than chemical, being: a lack of commercially developed continuous extractors; the limitations of present filtering methods; and unsatisfactory methods of removal and recovery of the chemical solvents.

In spite of its handicap, the inherent advantages of the extraction method are such that mechanical methods must be the subject of a vigorous research program for the next few years to maintain their importance in the edible vegetable-oil industry.

Fourteen Months
—and Twenty-One Letters—
To Sell a $50 Change Part!

Who is the loser? Who is at fault? . . . Here is a chronological history of an actual case . . . The participants, whose names will not be given on request:

A WELL-KNOWN MACHINERY COMPANY—*the seller*
AN EQUALLY WELL-KNOWN MANUFACTURER—*the buyer*

SELDOM have orders required such an unusual series of negotiations as those to follow, although huge orders sometimes have. But in this case the cause of the prolonged interchange of letters was a pair of change parts for a machine. After a year of dickering, the order for one part was finally placed. But the order was but an episode in the still unfinished story.

The beginning was an inquiry on March 17 of last year from the buyer to the seller for the price of change parts for pint- and quart-size containers.

On March 29 the seller quoted $125 for both parts. So far, so good.

But the buyer, as buyers have been known to do, protested that such a price was excessive. Couldn't the seller reduce the figure, he wanted to know, if he sent no mechanic to install the parts?

The seller stood pat, and the matter rested for eight months.

To smooth the way, on Jan. 20 last the buyer sent some more parts for repair, and asked again for a price on the new change parts. The seller, in view of decreased prices, was able to quote $100 for the parts and $150 for a complete overhauling of the machine.

But the figure was still too high for the buyer, who asked for a price on the pint-size part only. On Jan. 27, the quotation $55 was sent him.

Three days later the buyer complained that $55 was too much, as he could obtain the same part for $50 from a local mechanic. He would buy at that figure, he inferred, if the other chose to sell.

Weakening, the seller accepted the order and executed it within three days at $50. Here the affair should have terminated. On the contrary, the seller's troubles increased.

Suddenly, on March 16, the buyer remembered his worn parts still at the seller's shop and asked that they be reconditioned. This was done. When they were returned, the buyer sent his check for $50.

Two days later he sent back one of the parts for further repair, with the instruction not to alter a pin accompanying them even though it was worn out.

When the shop had filed the clip and returned it in short order, the seller received both a complaint that the filing was incorrectly done and a demand for a new clip.

Tired, but still courteous, the seller sent a new clip, and asked that the bearing be filed to adjust the fit. The buyer retorted that the bearing, if filed, would be ruined for handling other sizes of containers, and requested a new bearing.

To settle this new difficulty, the seller sent a new bearing and an invoice for $6.85. The latter was returned with a reminder that the cost of the bearing was included in the original quotation.

Perhaps both buyer and seller abandoned hope of settling the difficulty equitably. At any rate, the seller has on his books an open account for $6.85 against the buyer, while both have in their files 21 separate communications constituting a beautiful story.

. . . What is your comment on this episode? Would you have handled it in this way if you were the buyer? Obviously something was wrong, but what was it?—EDITOR.

Poisoned Foods

Arsenic and lead spray residues are a growing menace to the health of food consumers, recent scientific investigations indicate. Of 1,169 samples examined by the Food and Drug Administration, 11 per cent contained arsenious oxide in excess of 0.01 grain per pound, the world tolerance figure.

The effect of the poisonous residues has been studied at Stuyvesant Square Hospital, New York, N. Y., and reported to the American Chemical Society. The report states that the arsenic causes skin diseases and various gastro-intestinal disturbances.

WHERE DO WE BELONG—

Under N.I.R.A. or A.A.A.?

Food Manufacturers Face Puzzling Problem as General Johnson's Organization Takes Shape

ALL industry now is to function either under the National Industrial Recovery Act or, as in the case of many of the food processing industries, under the Agricultural Adjustment Act. The administration of both laws will be closely coordinated. Gen. Hugh S. Johnson, industrial administrator, anticipates that nearly one-third of all industry will go forward under the jurisdiction of Henry A. Wallace, Secretary of Agriculture. The Agricultural Adjustment Act authorizes agreements affecting other than the basic agricultural commodities, to which the principal provisions of the law are addressed, and the Industrial Recovery law authorizes President Roosevelt to delegate to Secretary Wallace any of the powers vested in the President.

Many industries that expected to function under Gen. Hugh Johnson's administration may, consequently, find that their ultimate place is under the Agricultural Adjustment Administration. These industries may be baking, canning, preserving, confectionery, fish canning, as well as others which may regard themselves as somewhat far removed from the farm. This need not interfere with their plans for organization, however, as *the essential steps are the same under both laws*. The line of demarcation will be drawn when they establish contact with administrative officials.

The Industrial Recovery Act is designed to create immediate employment through the public works program and to stimulate industrial activity through codes and agreements setting higher standards of operation and competition. It has as its major objectives: reemployment, higher wages, shorter working hours to distribute employment, all for the purpose of creating buying power.

Well in advance of the formal enactment of the law, an emergency organization was set up to make preliminary plans. Appointed without portfolio, several weeks before official confirmation, General Johnson attacked the problem immediately because the restoration of public purchasing power was recognized as far more important than the mere increase in the volume of industrial production and the upward trend of prices inspired by the fear of inflation. It was acknowledged that this specious activity would collapse unless the administration's program was carried into action without delay.

GENERAL HUGH S. JOHNSON

So that the recovery drive would not merely increase the momentum of industrial operations, without taking up the lag in buying power, General Johnson is insisting that wages must rise ahead of prices, that men must be brought back into industry before further labor-saving machinery is installed or production capacity is otherwise increased. He is apprehensive that industry, lured by the prospect of rising prices, will push production beyond market demand and that this will be followed by a relapse.

General Johnson has attempted, from the start, to dramatize the administration of the Industrial Recovery Act in order to bring public opinion to his support. Without it, the program cannot succeed. Obviously, the big industries were attacked first: textiles, steel, automotive and the like. Even in those giving employment to fewer workers, the objective is to function through comprehensive agencies that are industry-wide in sweep and effective from raw material to ultimate merchandising. Such coordination of diverse parts of the industry and complete integration vertically would, in the judgment of administration leaders, make practical within a short time a reasonably comprehensive effort embracing all classes of workers. Without such wide sweep, serious disparity between wages received and prices paid would occur, and it was feared that the program might break down through inequities caused.

The objects sought by the Industrial Recovery Act and the authority given under it are very much like those provided in the Farm Relief legislation passed weeks earlier. General Johnson's broad attack differs materially from that temporarily resorted to by Secretary Wallace. The Secretary was confronted with armed warfare in a few localities, particularly in the Milwaukee, Chicago and New York milk sheds. Expediency, therefore, dictated regional action and

special agreements with small divisions of the milk-products business.

But the principles governing Secretary Wallace's action do not differ from those which are expected to control industry agreements. Raw-materials prices must be raised to original producers. Wages paid to manufacturing labor must rise. Hours of employment per man must be curtailed so that the maximum number will have jobs. Thus, the aggregate income of raw material producers and wage earners is to be increased as rapidly as possible. This will translate itself into new buying power, the major economic objective.

Labor Cannot Dictate

In appointing General Johnson, President Roosevelt also named a special board of Cabinet and departmental officials under the chairmanship of Daniel C. Roper, Secretary of Commerce. General Johnson does not regard his relation to this board as in any way attenuating his authority and responsibility in the administration of the Recovery Act. But the board will serve, according to General Johnson, to coordinate and mobilize all the existing government agencies behind the program. His advisory boards representing industry and labor are made up of specialists who have no vote, hence may include safely even the violent partisans. They do include several whose presence has thrown a chill into the heart of industrial executives, fearing that this legislation was merely to become a tool of labor organizers. General Johnson promptly squelched any such concept. He wants the best advice labor can give, but will not be dictated to by any party. Labor also has no need to fear undue influence from industrial executives, as the workers' rights are clearly recognized and their needs are paramount in the plan.

Other industries than those manufacturing food are expected to work through great trade association groups. For each major industry there will be a central organization representing all points of view and interest. Under it in each case may be as many subsidiary organizations or committees for regional, commodity or specialized function as the problems faced may make necessary. The contact between the administrator and the whole industry will, wherever possible, be through the central agency, which is supposed to have adequate power to represent all subsidiary parts of its business.

The administration desires to function through codes initiated by the industries and proposed to the government merely for review and approval. The major industries are already taking steps toward the drafting and submission of such codes. Hearings will follow promptly.

General Johnson emphatically recommends that industrial groups *do not attempt, initially, to include in their codes all the provisions that may be desirable to suppress pestiferous practices on which it is difficult to reach a common agreement.* His desire is that all industries concentrate their attention for the present on the vital provisions governing wages, hours of labor and working conditions. The codes may be elaborated or amended later. Codes prescribed for industries that do not cooperate voluntarily will be limited to the essentials, but the program leaves no loophole for slacker industries.

In many industries a majority are expected to formulate a code. Minorities will not then be allowed to obstruct effective working. Where the minorities may not by persuasion be brought to cooperation, the President may order licensing. Any concern to operate must have a license. If it violates the code approved by the government, its license may be withdrawn. Obviously, it is then shut down automatically. The teeth are strong and sharp. They will be used if needful. But the fewer such cases requiring compulsion, the better pleased will be the administration.

Price Fixing Possible

Where industries can agree on marketing practices without actual resort to price agreements, this will satisfy the government. But in some cases it is confidently expected that "open price agreements" will be necessary. The administration apparently will not hesitate to approve such where needful to control cut-throat competition, selling below cost, unauthorized trade discounts or other unfair marketing schemes. In general, however, in the price policies, as in other matters, the judgment and wish of the majority of an industry will govern so long as they are able to fix on a program which the government believes meets the following three criteria:

1. The terms under which the operation of anti-trust laws is suspended must be fair to the public.

2. The code must come as near as possible to being fair to all units of the industry and to the employees.

3. The code must protect the majority against the "chiseling fringe."

The government's function after the adoption of a code will be to prevent abuses under it, apply licensing and penal provisions where necessary, and arrange for adequate readjustments as defects develop. The objective still remains SELF-regulation by industry so far as possible. The government will be arbiter; it does not wish to be czar or policeman.

In order to prevent importers from defeating the purpose of the bill, imported products will be subject to control on complaint that their importation either is detrimental to any industry operating under a code or results in unfair methods of competition. It is expected that this drastic authority will enable the administrator to set up much the same sort of control over import trade as over domestic industry without resorting to actual embargo. Licensing of importers will be the means utilized.

The Contrast

N.I.R.A. is designed to help labor, while A.A.A. is to help the farmer. The place of the manufacturer in either scheme is only incidental. All he has to do is provide the money.

The A.A.A carries the mechanism of the processing tax, which sees to it that the money will be available to the Secretary for distribution to eligible farmers. In effect it makes certain price increases mandatory, for no other reason than to get the money.

On the other hand, the N.I.R.A. makes no provision other than the doubtful one of code agreements for the source of the money which is to be given to labor as increased wages or more employment. Industry, here, is asked to take a chance with N.I.R.A. that the money will come, somehow, via the sales route. As for companies with exhausted credit, the problem is still unsolved. General Johnson expects the banks to help.

A.A.A., however, permits the Secretary of Agriculture to license producers of products competing with basic agricultural products, so there is no escape for food manufacturers who choose to codify under N.I.R.A.; yet General Johnson is reported to have told one food group that they could not escape his plans to give labor more money by going over to A.A.A.

N.I.R.A. is largely manned by active business men. A.A.A. runs considerably to economists.

Proposed New Food and Drugs Law Embodies Fundamental Changes

THE proposed new Federal Food and Drugs Act appeared in first-draft form early in June for introduction into Congress as an official administration measure. It will not receive legislative consideration until next winter, but is put forward for discussion in interested industries. Hearings may be expected early in 1934 before the Congressional committees in charge.

To the surprise of many, this is an entire new law, repealing the existing statutes which have been built up since 1906. In its draft the department has retained the phrasing of the old law in certain sections. This retains also the body of judicial findings built up by many court actions. In other cases entirely new provisions of the law are proposed with a view to more effective or more sweeping administration. These sections will, of course, have to stand the test of court action subsequent to enactment.

In transmitting the bill to Congress, Secretary Wallace cited seven major new provisions, including:

1 The prevention of false advertising. The need for the control of serious abuses in this field is generally recognized.

2 The inclusion of cosmetics. Serious injuries have occurred through the sale and use of cosmetic products of a character harmful to the user. The practice of deceptive labeling and advertising of such products should be regulated.

3 The establishment of tolerances for added poisons in foods. A complete elimination of all poisonous substances from foods may be impossible. Where the presence of poisons is unavoidable, their amounts should be kept so low that by no possibility will the food be harmful to health. The present law contains no provision authorizing the establishment of tolerances for poisons, but imposes upon the government the obligation of showing affirmatively in every case that a food containing poisonous substances may be harmful to health independent of similar adulterations prevailing extensively in other foods.

4 Authority for the Secretary, after notice and hearing, to promulgate definitions and standards for foods which will have the force and effect of law. Under the present law such authority extends to the field of canned foods only. Legal food standards like those now existing for official drug products are essential for efficient enforcement operations.

5 Power to require manufacturers to procure in certain cases federal permits. This method of regulation will be invoked in those instances only where a menace to health is involved and where adequate protection to the public cannot be effected through the other provisions of the bill.

6 The control of drug products on the basis of therapeutic claims which are contrary to the general agreement of medical opinion. This removes the burden imposed by the present law of proving not only that such statements are false but that they were made with fraudulent intent on the part of the manufacturer. This has seriously handicapped the department in the extension of adequate protection to the public in the purchase of drugs labeled as treatments for various diseases.

7 Requirement of informative labels. With one or two minor exceptions the present food and drugs act contains no positive labeling requirement. It merely prohibits false or misleading statements, and these prohibitions are to some extent minimized by excepting provisos. A disclosure on the label of sufficient facts to enable intelligent and discriminating buying will operate unquestionably to the advantage of the consumer.

CERTAIN subdivisions of the food and drug industries are already raising important questions that will demand Congressional consideration. It was to provide for such cases that the administration desired the bill introduced long in advance of active legislative hearings. Vigorous debate is expected on the authorizations 5 and 6, which represent sweeping new authority of regulation by the Secretary in medical fields.

The text of the bill as it applies to the manufacture, shipment and sale of food is as follows. The omitted text deals specifically with drugs and/or cosmetics.

A BILL

To prevent the manufacture, shipment and sale of adulterated or misbranded food*, and to regulate traffic therein; to prevent the false advertisement of food* and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Federal Food and Drugs Act."

DEFINITIONS

SEC. 2. As used in this Act, unless the context otherwise indicates:

(a) The term "food" includes all substances and preparations used for, or entering into the composition of, food, drink, confectionery or condiment for man or other animals.

(d) The term "Territory" means any Territory or possession of the United States.

(e) The term "interstate commerce" means (1) commerce between any State or Territory and any place outside thereof, or between points within the same State or Territory but through any place outside thereof, and (2) commerce and manufacture within the District of Columbia or the Canal Zone or within any Territory not organized with a legislative body.

(f) The term "person" includes individual, partnership, corporation and association.

(g) The term "Secretary" means the Secretary of Agriculture.

(h) The term "label" means the principal label or labels (1) upon the immediate container of any food* and (2) upon the outside container or wrapper, if any there be, of the retail package of any food.*

(i) The term "labeling" includes all labels and other written, printed and graphic matter, in any form whatsoever, accompanying any food.*

(j) The term "advertisement" includes all representations of fact or opinion disseminated in any manner or by any means other than by the labeling.

(k) The term "in package form" includes wrapped meats inclosed in paper or other materials as prepared by the manufacturers thereof for sale.

ADULTERATION OF FOOD

SEC. 3 A food shall be deemed to be adulterated:

(a) (1) If it is or may be dangerous to health; or (2) if it bears or contains any added poisonous or added deleterious substance prohibited, or in excess of the limits of tolerance prescribed, by regulations as hereinafter provided; or (3) if it consists in whole or in part of any filthy, putrid or decomposed substance; or (4) if it has been prepared, packed or held under unsanitary conditions whereby it may have become contaminated with filth; or (5) if it is the product of a diseased animal or of an animal which has died otherwise than by slaughter; or (6) if its container is composed of any poisonous or deleterious substance which may by contamination render the contents injurious to health.

(b) (1) If any valuable constituent has been in whole or in part abstracted therefrom; or (2) if any substance has been substituted wholly or in part therefor; or (3) if damage or inferiority has been concealed in any manner; or (4) if any substance has been mixed or packed there-

*Also drugs and cosmetics.

with so as to increase its bulk or weight, or reduce its quality or strength, or create a deceptive appearance.

(c) If it is confectionery and bears or contains any alcohol, resinous glaze or non-nutritive substance except coloring and flavoring.

(d) If it contains a coal-tar color other than one from a batch that has been certified by the Secretary in accordance with regulations as hereinafter provided.

MISBRANDING—GENERAL

SEC. 6. A food* shall be deemed to be misbranded:

(a) If its labeling is in any particular false or by ambiguity or inference creates a misleading impression regarding any food.*

(b) If in package form and it fails to bear a label containing: (1) the name and place of business of the manufacturer, packer, seller or distributor; and (2) an accurate statement of the quantity of the contents in such terms of weight, measure or numerical count as may be prescribed by regulations of the Secretary: *Provided,* That under subdivision (2) of this paragraph reasonable variations shall be permitted, and exemptions as to small packages of foods and cosmetics shall be established, by regulations prescribed by the Secretary; and *Provided further,* That such classes of canned foods as the Secretary finds, after notice and hearing, are, in accordance with the practice of the trade, labeled in substantial quantities at establishments other than the establishments where processed or packed, shall be exempted by regulations from the requirements of this paragraph during transportation from the establishment where processed or packed to an establishment for labeling, if such articles are labeled in conformity with the provisions of this Act prior to removal from such labeling establishment.

(c) If any word, statement or other information required on the label to avoid adulteration or misbranding under any provisions of this Act is not prominently placed thereon in such a manner as to be easily seen and in such terms as to be readily intelligible to the purchasers and users of such articles under customary conditions of purchase and use.

MISBRANDING OF FOOD

SEC. 7. A food shall be deemed to be misbranded:

(a) If (1) its container is so made, formed or filled as to mislead the purchaser, or (2) its contents fall below the standard of fill prescribed by regulations as hereinafter provided.

(b) If it is offered for sale under the name of another food.

(c) If it is an imitation of another food, except that no imitation shall be deemed to be misbranded under this paragraph if its label bears the word "imitation" in juxtaposition with and in type of the same size and prominence as the name of the food imitated.

(d) If it purports to be or is represented as a food for which a definition of identity has been prescribed by regulations as hereinafter provided, and (1) fails to bear on its label the name of the food defined in such terms as the regulations specify, or (2) fails to conform to the definition.

(e) If it purports to be or is represented as a food for which standards of quality have been prescribed by regulations as hereinafter provided, and (1) fails to state on its label, if so required by the regulations, a standard of quality in such terms as the regulations specify, or (2) falls below the standard stated on the label.

(f) If it purports to be or is represented as a food for which no definition of identity has been prescribed by regulations as hereinafter provided, and its label fails to bear (1) the common or usual name of the food, if any there be, and (2) the common or usual name of each ingredient thereof in order of predominance by weight; except that spices, flavors and artificial colors may be designated as such without naming each spice, flavor or artificial color. The Secretary is hereby authorized to prescribe by regulations requirements for such further information on the label thereof as he may deem necessary to protect the public from deception.

FALSE ADVERTISEMENT

SEC. 9. (a) An advertisement of a food* shall be deemed to be false if in any particular it is untrue, or by ambiguity or inference creates a misleading impression regarding such food.*

TOLERANCES FOR POISONOUS INGREDIENTS IN FOOD AND COSMETICS AND CERTIFICATION OF COAL-TAR COLORS FOR FOOD

SEC. 10. (a) If the Secretary finds that the presence of an added poisonous or added deleterious substance in or on food or cosmetics is or may be injurious to health, taking into account other ways in which the consumer or user may partake of or be exposed to the same or other poisonous or deleterious substances, then the Secretary shall by regulations promulgated after notice and hearing prohibit such added substances in or on food or establish tolerances limiting the amount therein or thereon, to such extent as he may deem necessary to prevent such injury to health.

(b) The Secretary is hereby authorized to make regulations, after notice and hearing, for the certification of coal-tar colors which he finds to be harmless for use in food.

DEFINITIONS AND STANDARDS FOR FOOD

SEC. 11. The Secretary is hereby authorized to fix, establish and promulgate definitions of identity and standards of quality and fill of container for any food. Whenever the Secretary deems that for the purposes of this Act any such definition or standard should be established for any food, he shall give notice of a proposed definition or standard and of the time and place of a public hearing to be held thereon not less than 30 days after the date of such notice. After such public hearing the Secretary may fix, establish and promulgate a definition or standard for such food. The definition or standard so promulgated shall become effective on a date fixed by the Secretary, which date shall not be prior to 90 days after its promulgation. Any such definition or standard may be amended or repealed after notice and hearing as hereinbefore provided, and if amended or repealed, the amendment or repeal shall become effective in the manner and at the time hereinbefore provided.

PERMIT FACTORIES

SEC. 12. (a) Whenever the Secretary finds that the distribution in interstate commerce of any class of food* may, by reason of conditions surrounding the manufacture, processing or packing thereof, be injurious to health, and such injurious nature cannot be adequately determined after such articles have entered interstate commerce, he is authorized, after notice and hearing, to make such regulations governing the conditions of manufacture, processing or packing as he deems necessary to protect the public health, and requiring manufacturers, processors and packers of such class of articles to hold a permit conditioned on compliance with such regulations.

(b) The Secretary is authorized to issue such permits for such periods of time as he may by regulations prescribe and to make regulations governing the issuance and renewal thereof. The Secretary is authorized to suspend immediately upon notice any permit issued under authority of this section if it is found that any of the conditions of the permit have been violated. The Secretary may reinstate the permit whenever, after hearing and an inspection of the establishment, it is found that adequate measures have been taken to comply with the conditions of the original permit.

(c) Any officer or employee duly designated by the Secretary shall have access to any factory or establishment, the operator of which holds a permit from the Secretary, for the purpose of ascertaining whether or not the conditions of the permit are being complied with, and denial of access for such inspection shall be ground for suspension of the permit until such access is freely given by the operator.

FACTORY INSPECTION

SEC. 13. (a) In order adequately to regulate interstate commerce in food,* and enforce the provisions of this Act, officers or employees duly designated by the Secretary, after first obtaining permission of the owner, operator or custodian thereof, are authorized (1) to enter any factory, warehouse or establishment in which foods* are manufactured, processed, packed or held for shipment in interstate commerce or are held after such shipment, or to enter any vehicle being used to transport such food* in interstate commerce; and (2) to inspect such factory, warehouse, establishment or vehicle and all equipment, methods, processes, finished and unfinished materials, containers, and labels there used or stored.

(b) (1) The several District Courts of the United States are hereby vested with jurisdiction to restrain by injunction, temporary or permanent, the shipment in interstate commerce or delivery after receipt in interstate commerce of any food* from or by any factory, warehouse, establishment or vehicle, if the owner, operator or custodian thereof has denied to officers or employees duly designated by the Secretary permission so to enter and inspect such factory, warehouse, establishment or vehicle and equipment, methods, processes, finished and unfinished materials, containers and labels there used or stored. Whenever such permission is

granted, the injunction issued pursuant to this paragraph shall be dissolved, or may be continued in force subject to such conditions governing the inspection as the court may order; and (2) violation of any such injunction may be summarily tried and punished by the court as a contempt. Such contempt proceedings may be instituted by order of the court or by the filing of an information by the United States Attorney.

RECORDS OF INTERSTATE SHIPMENT

SEC. 14. For the purpose of enforcing the provisions of this Act, carriers subject to the Interstate Commerce Act, as amended (U.S.C., title 49), and other carriers engaged in interstate commerce, and persons receiving food* in interstate commerce, shall, upon the request of an officer or employee duly designated by the Secretary, permit such officer or employee to have access to and to copy all records showing the movement in interstate commerce of any food,* and the nature, kind, quantity, shipper and consignee thereof, and it shall be unlawful for any such carrier or person to fail to permit such access to and copying of any record so requested: *Provided,* that evidence obtained under this section shall not be used in a criminal prosecution of the person from whom obtained.

INVESTIGATIONS AND INSTITUTIONS OF PROCEEDINGS

SEC. 15. (a) The Secretary is authorized to conduct examinations and investigations for the purposes of this Act through officers and employees of the Department of Agriculture or through any health, food or drug officer or employee of any State, Territory or political subdivision thereof, duly commissioned by the Secretary.

(b) It shall be the duty of each United States Attorney to whom the Secretary reports any violation for institution of criminal, libel for condemnation, or other proceedings under this Act, or to whom any health, food or drug officer of any State or Territory, or political subdivision thereof, presents evidence satisfactory to the United States Attorney of any such violation, to cause appropriate proceedings to be instituted in the proper courts of the United States without delay. All suits instituted under this Act shall be by and in the name of the United States.

(c) The Secretary shall, before reporting any violation of this Act to the United States Attorney for institution of criminal proceedings thereunder, afford due notice and opportunity for hearing to interested parties in accordance with such regulations as the Secretary shall prescribe. The report of the Secretary to the United States Attorney for the institution of criminal proceedings under this Act shall be accompanied by findings of the appropriate officers and employees duly authenticated under their oaths.

SEIZURE

SEC. 16. (a) Any article of food* in interstate commerce that is adulterated or misbranded or that has been manufactured, processed or packed in a factory or establishment, the operator of which did not, at the time of manufacture, processing or packing, hold a valid permit if so required by regulations under Sec. 12, shall be liable to be proceeded against while in interstate commerce or at any time thereafter on libel of information and condemned in any District Court of the United States within the jurisdiction of which the article is found. The article shall be liable to seizure (1) by process pursuant to the libel, or (2) if a chief of station or other officer of the Food and Drug Administration, duly designated by the Secretary, has probable cause to believe that the article is so adulterated as to be imminently dangerous to health, then by order of such officer, issued under his oath of office, particularly describing the article to be seized, the place where located, and the officer or employee to make the seizure. In case of seizure pursuant to any such order, the jurisdiction of the court shall attach upon such seizure. Any article seized pursuant to any such order shall thereupon be promptly placed in the custody of the court and a libel of information shall be promptly filed for condemnation thereof.

(b) If recovery is had in any suit or proceeding against any officer or employee by reason of a seizure pursuant to any such order, and the court certifies that there is probable cause for the acts done by such officer or employee, or that he acted under the direction of the Secretary or a duly designated officer of the Food and Drug Administration, no execution shall issue against such officer or employee, but the amount so recovered shall upon final judgment be provided for and paid out of appropriations for the administration of this Act.

(c) The court may, by order at any time before trial, allow any party to a condemnation proceeding to obtain a representative sample of the article seized.

(d) Any article of food* condemned under this section shall, after entry of the decree, be disposed of by destruction or sale, as the court may, in accordance with the provisions of this section, direct, and the proceeds thereof, if sold, less the legal costs and charges, shall be paid into the Treasury of the United States; but such article shall not be sold under such decree contrary to the provisions of this Act or the laws of the jurisdiction in which sold: *Provided,* that after entry of the decree and upon the payment of the costs of such proceedings and the execution of a good and sufficient bond conditioned that such article of food* shall not be sold or disposed of contrary to the provisions of this Act or the laws of any State or Territory, the court may by order direct that such article be delivered to the owner thereof to be destroyed or brought into compliance with the provisions of this Act under the supervision of an officer or employee duly designated by the Secretary, and the expenses of such supervision shall be paid by the party obtaining release of the article under bond. Any article condemned by reason of the manufacturer, processor or packer not holding a valid permit when so required by regulation under Sec. 12 shall be disposed of by destruction.

(e) The proceedings in cases under this section shall conform, as nearly as may be, to the proceedings in admiralty; except that either party may demand trial by jury of an issue of fact joined in any such case.

(f) When a decree of condemnation is entered against the article, court costs and fees, and storage and other proper expenses, shall be awarded against the person, if any, intervening as claimant of the article.

PENALTIES

SEC. 17. (a) The following acts are hereby prohibited:

(1) The introduction into interstate commerce of any food* that is adulterated or misbranded.

(2) The receipt in interstate commerce of any food* that is adulterated or misbranded and the delivery or proffered delivery thereof in the original unbroken package for pay or otherwise.

(3) The dissemination of any false advertisement by radio broadcast, United States mails, or in interstate commerce for the purpose of inducing, directly or indirectly, the purchase of food.*

(4) The dissemination of a false advertisement by any means for the purpose of inducing, directly or indirectly, the sale of food* in interstate commerce.

(5) The introduction into interstate commerce of any food,* if the manufacturer, processor or packer does not hold a valid permit when so required by regulations under Sec. 12.

(6) The refusal to permit access to or copying of any record as required by Sec. 14.

(b) Any person who violates or causes to be violated any of the provisions of paragraph (a) of this section shall be guilty of a misdemeanor and shall on conviction thereof be subject to imprisonment for not more than one year, or a fine of not less than $100 nor more than $1,000, or both such imprisonment and fine; and for a second or subsequent offense imprisonment for not more than two years, or a fine of not less than $500 nor more than $3,000, or both such imprisonment and fine.

(c) Notwithstanding the provisions of paragraph (b) of this section, in case of a wilful offense the penalty shall be imprisonment for not less than six months nor more than three years, or a fine of not less than $1,000 nor more than $10,000, or both such imprisonment and fine.

(d) No person acting in the capacity of publisher, advertising agency, or radio broadcast licensee shall be prosecuted under paragraph (b) or (c) of this section for disseminating a false advertisement if, on request of an officer or employee duly designated by the Secretary, he furnishes the name and post office address of the person who contracted for or caused him to disseminate such advertisement.

(e) No dealer shall be prosecuted under paragraph (b) of this section if he establishes a guaranty or undertaking signed by the person residing in the United States from whom he received the article of food* or the advertising copy therefor, to the effect that such person assumes full responsibility for any violation of this Act, designating it, which may be incurred by the introduction of such article into interstate commerce or by the dissemination of such advertising. To afford protection, such guaranty or undertaking shall contain the name and address of the person furnishing such guaranty or undertaking, and such person shall be amenable to the prosecution and penalties which would attach in due course to the dealer under the provisions of this Act.

(*Turn to page 288*)

Saving Money in Buying and Using

Quality Products and Adequate Control System Result in Low Operating and Maintenance Cost

COMPANIES in the food industries can reduce the operating and maintenance costs of their automotive equipment by purchasing quality motor fuel, lubricating oils and chassis greases from reputable companies. Besides insuring the quality and uniformity of the product, such procedure will also permit the food concerns to take advantage of the engineering service offered by the reputable gasoline and oil companies as a check against their own maintenance policies.

In keeping with the fundamental law that quality always pays in the long run, quality in gasoline fuel is necessary to prevent power loss; preignition; quick carbonization; fouled spark plugs; engine pitting caused by fuel of excessive sulphur content and subsequent high engine maintenance cost; high fuel consumption and high fuel cost per truck-mile run.

The harmful effects on the engine of a poor grade of lubricating oil include a rapid wear of parts, sludging, burned-out bearings, loss of time out of service, high engine maintenance cost, high oil consumption and a high engine lubrication cost per mile. Similar harmful effects result from the use of inferior grades of chassis oils and greases.

Uniformity of gasoline motor fuel is necessary in order to keep carburetor adjustments constant under given operating conditions. Otherwise, a high fuel consumption and high fuel cost will result. Uniformity in engine oils selected as the best fitted for the service to be rendered makes it possible to maintain the oil-change periods determined upon. Similarly, uniformity in chassis oils and greases makes it possible to maintain whatever lubrication schedules are set up.

Practically all of the large gasoline and oil companies extend to their customers a free engineering service covering the selection and use of motor fuels, oils and greases. This service is of a high order; serves as an outside check on existing maintenance procedures and almost always results in substantial savings in the products being used.

Continued advancement in the profession of automotive maintenance by large users of trucks and passenger cars in the food field has shown the fallacy of buying such products on price alone instead of on a combination of price and quality. Many fleet owners have found that the cost per mile for motor fuel, oil and grease at the end of a year is more important than a low first cost of such products without the essential performance factor being taken into account. This desirable result has been brought about in part by the engineering service which, while primarily intended to be of value to the supplier, has also been of great value to the user by reason of the economies secured.

The engineering service rendered in connection with gasoline has been principally in the most economical use of the fuel after the proper initial selection has been made in consideration of engine-compression ratios, engine and vehicle speeds and other operating conditions. In this work the exhaust gas fuel analyzer has been one of the most important instruments employed.

As its name indicates, the analyzer

CITIES SERVICE POWER PROVER ADJUSTMENT REPORT

Date _____ Co _____ Station _____
Owners Name _____ Telephone # _____
Owners Address _____
Make of Car _____ Year _____ Mileage _____
Motor — Make _____ Type _____ # Cylinders _____
Carburetor — Make _____ Type _____ Type Gas. Feed _____
Ignition System — Make _____ Type _____
Brand Gas. used in Test _____ Motor Oil used in Test _____
POWER PROVER READING FIRST — IDLE _____ R.P.M. _____
P. P. READING WITH FRESH C. CASE FILL — " _____ R.P.M. _____

SPARK PLUGS — Miles Used

Correct Gap _____ Thousandths of One Inch _____ Should Fire Under _____ Pounds of Compression

BEFORE — CLEANING and ADJUSTING — AFTER							
Cylinder	Make Plugs	Gap Found	Comp. Test	Cylinder	Make Plugs	Gap Set to	Comp. Test
#1				#1			
#2				#2			
#3				#3			
#4				#4			
#5				#5			
#6				#6			
#7				#7			
#8				#8			

Remarks _____

MOTOR TIMING	BREAKER POINTS	COIL ETC.
Correct Timing	Correct Gap "	Coil Test
Timing as Found	Gap Found "	Condenser Test
After Adjustment	Gap Set To "	Wiring Test

Check of Timing and Automatic Spark Advance At Speed: _____
Remarks _____

P. P. READG. AFTER PLUG, TIMING & IGN. ADJTS. IDLE _____ R.P.M. _____

CARBURETOR ADJUSTMENTS

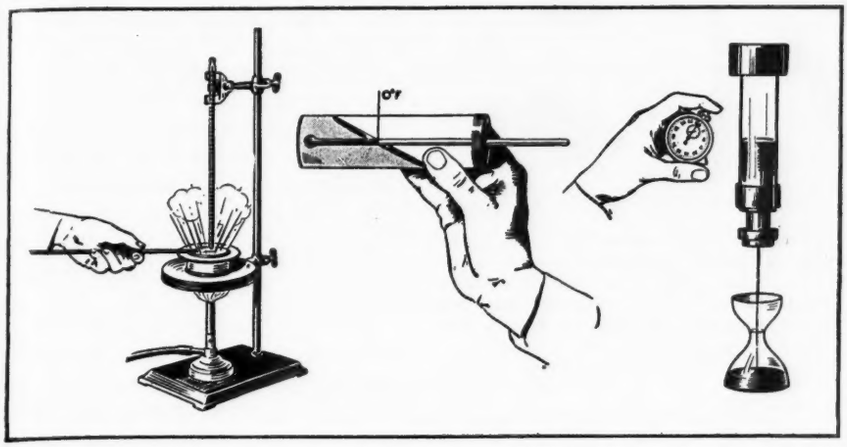
Idle Adj. _____
Speed Adj. _____
Float Level _____
Feed System _____
Remarks _____
POWER PROVER READINGS - FINAL — IDLE _____ R.P.M. _____
MOTOR EFFICIENCY IMPROVED — IDLE _____ R.P.M. _____
Performance Test _____
Remarks _____
Test by _____ Adjustments by _____

Power Prover Adjustments For _____ By CITIES SERVICE OIL COMPANY DATE STARTED FINISHED Sheet No.

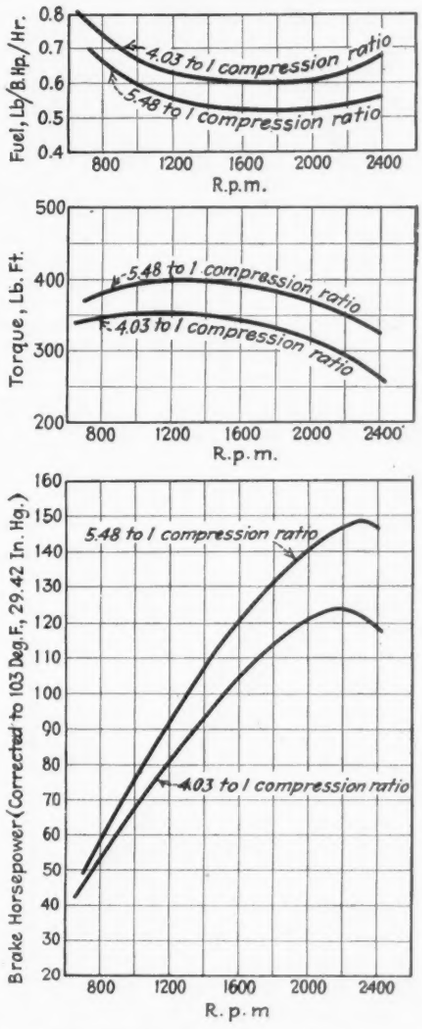
DESCRIPTION OF VEHICLE TESTED				% COMBUSTION EFFICIENCY						FUEL CONSUMPTION MILES PER GALLON		SAVINGS	BREAKER POINTS		IGNITION TIMING		COIL	CONDENSOR	SPARK PLUGS			CARBURETOR		CHECKED BY	REMARKS: Nom.- SET = SET'S SPEC. N. C. = NO CHANGE O. P. = OFF PANEL ENUMERATE ANY SUBSTITUTIONS
				BEFORE ADJUSTMENT			AFTER ADJUSTMENT												GAP						
CAR OR TRUCK MAKE	MOTOR MAKE AND TYPE	NO. OF CYL'S	YEAR	IDLE	INT.	SPEED	IDLE	INT.	SPEED	BEFORE ADJUSTMENT	AFTER ADJUSTMENT		POUND	SET	POUND	SET			POUND	SET	CONDITION	MAKE	DETAILS		

Above at left is shown a Cities Service Power Prover in actual use with one truck of a large fleet operated in the food field. Top, right, is one of the complete forms used to record the test data developed on each individual truck in the fleet. Directly above is shown part of the summary test sheet for recording periodic test data for fleets operating out of one or more garages.

Motor Truck Fuels and Lubricants



Flash and fire points; pour test and viscosity index illustrations as taken from the Standard Oil Co. (Chicago) booklet entitled "How to Reduce the Operating Cost of Trucks, Buses, Taxicabs and Passenger Cars" and as mentioned elsewhere in the article text. The booklet fully outlines Standard's engineering service for fuel, lubricating oils and greases.



Charts showing how the use of Ethyl gasoline in a truck engine whose compression ratio has been increased from 4.03 to 1 to 5.48 to 1 indicates a reduction in fuel consumption and an increase in both engine horsepower and torque. The compression ratio was increased by alternate pistons furnished by the engine manufacturer

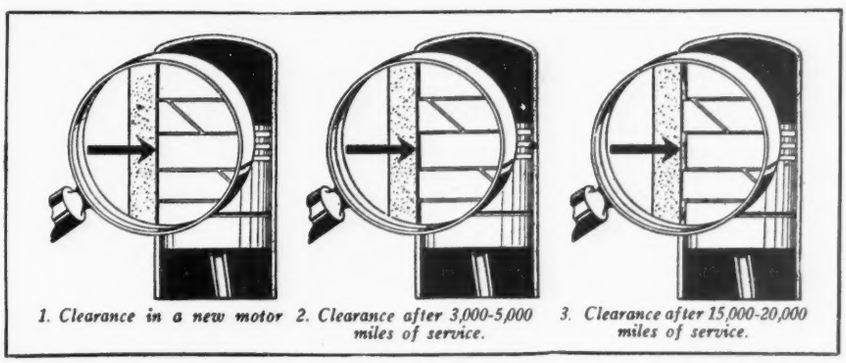
tests the engine exhaust gases and indicates on a dial the degree of incomplete combustion, which means fuel wastage. There are several such machines in use today. They work on different principles but seek the same result: the degree of incomplete combustion. Likewise they all seek to substitute for rule-of-thumb methods of judging an engine's operation, a scientific means of determining its running efficiency.

One of the outstanding exhaust gas fuel analyzers is the Power Prover, developed by the Cities Service research engineers. This analyzer is not sold on the open market. Its use is limited to users of Cities Service products as a part of a mechanical truck maintenance service.

This service, while complete in each instance, is rendered under three different plans. For large fleets, one or more of the Power Provers are loaned for installation in the fleet owner's garages and become an integral part of his maintenance equipment. For medium-sized fleets, the service is rendered every three months, or more often if necessary, by means of a test car equipped with the Power Prover and auxiliary apparatus.

Where very small feets numbering only a few vehicles are involved, the owner is privileged to send his vehicles at periodic intervals to a designated service station where the permanent apparatus is set up for the testing work. In such cases the Cities Service organization keeps a card index system by which the owner is reminded in writing as to the exact date when each of the vehicles should be brought in for testing.

After the engine to be tested is warmed to operating temperature, a sample of the exhaust gas is drawn into the apparatus through a hose connected with a metal injector which is inserted in the exhaust pipe. The volume of the sample drawn into the machine is controlled by varying the flow of water through an aspirator. After the sample is cleaned and cooled by passing through several washers and filters, it passes into the analyzer proper, where the amount of unburned gas or CO is measured. The percentage of this unburned gas is expressed in terms of percentage of combustion efficiency and indicated on the dial of the machine. The time required from putting the injector into the exhaust pipe to securing the meter reading is about 2 minutes.



1. Clearance in a new motor *2. Clearance after 3,000-5,000 miles of service.* *3. Clearance after 15,000-20,000 miles of service.*

Graphic representation of the basis of the Sinclair Law of Lubrication that for every machine of every degree of wear there is a scientific Sinclair oil to suit its speed and seal its power. In actual fleet operation, however, Sinclair engineers will recommend compromise grades of the greatest average suitability to reduce the number of grades in use.

At the left, a burned valve caused by poor tappet adjustment; insufficient valve guide clearance; poor valve material; weak valve springs; off-center position or gum deposits that cause sticking. In the center are examples of worn, broken and warped valves. At the right, two spark plugs, the upper one clean and the lower, dirty. After long use with Ethyl gasoline, spark plugs may show a yellowish, glassy deposit, but this is not injurious in operation. It is not advisable to attempt to scrape this deposit.
Photographs by courtesy of the Ethyl Gasoline Corp.

The reading of the percentage of combustion efficiency is only the first step, for, while it tells when there is too much unburned gas in the exhaust gases, it does not tell what causes this condition. The remaining steps of the service are to determine why such a condition exists, and these include a series of extremely accurate adjustments of the three major essentials of good motor performance: carburetor, ignition and timing. In this work precision tools are used, several of them developed by and exclusive with Cities Service.

Although the ratio of air and fuel fed to the engine through its carburetor has a considerable bearing on the composition of the exhaust gases, ignition and timing, such as a late firing spark, may be responsible for some unburned gas or CO in the exhaust gases. When this condition is found not to exist, low combustion efficiency may result from an improper air-fuel carburetor ratio. This may be rectified by a change in carburetor jets.

When carburetor jets are reduced in size to effect economy, great care should be taken not to lean the mixture to such a point as to affect adversely the engine power and acceleration under load. This is provided against, since none of the final setting readings approaches 100 per cent combustion efficiency.

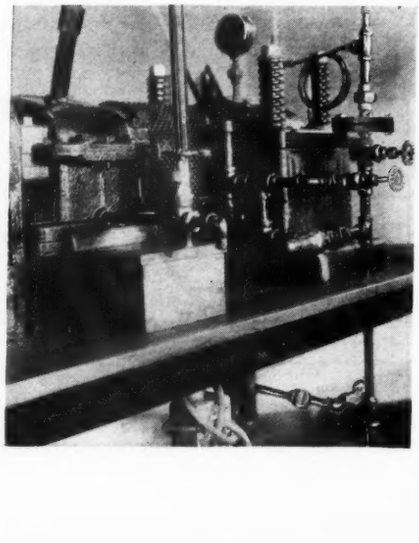
Utilization of a fuel engineering service such as the foregoing invariably results in fuel economy, not to mention other advantages. Although many instances of economies made by fleet owners in the food field as the result of Power Prover scientific service control might be quoted, the Clark Restaurant Co., of Cleveland, Ohio, reports a 10 per cent reduction in gasoline cost and the Keig-Stevens Baking Co., of Rockford, Ill., a gasoline mileage increase of 14 per cent.

Other fuel suppliers reporting to FOOD INDUSTRIES that they offer an engineering service on gasoline consumption include the Sinclair Refining Co., Standard Oil Co. of New Jersey and the Standard Oil Co. of Indiana. In the latter's booklet entitled "How to Reduce the Operating Cost of Trucks, Buses, Taxicabs and Passenger Cars," the Standard engineering service on gasoline consumption is fully outlined.

The Standard service includes a combustion test of the engine exhaust gases with subsequent adjustments in ignition, vacuum system, carburetor, etc., by trained Standard men. The booklet contains the significant statement that all combustion tests made to date have resulted in an average gasoline mileage increase of 17 per cent. This is roughly the equivalent of 2 cents discount per gallon.

Another form of fuel engineering service is offered by the Ethyl Gasoline Corp. in relation to the use in truck engines of premium grade non-detonating fuels containing tetraethyl lead. The fullest economy of such fuels cannot be obtained in low-compression engines, which as a general rule are those with a compression ratio of not over 4 to 1. An engine with a ratio of 5 to 1 or better is considered a high-compression engine. These ratios are the relationship of the volume of the combustion chamber when the piston is down to the volume when it is up.

The Navy Work Factor test machine as used in the testing laboratory of the Sinclair Refining Co. Oil tested in the machine for 100 hours shows the stability and durability characteristics equivalent to an actual service run of 5,000 miles.



While in the past few years high-compression engines have become the rule in the passenger-car field and while the trend is in the same direction in motor-truck-engine design, there are still many trucks in operation in the food field with low-compression engines. For these, the use of fuels containing tetraethyl lead offers gasoline economies when the compression ratio is increased.

Engine efficiency varies in direct ratio to its compression, and the higher its compression ratio, the more power will an engine extract from a given quantity of fuel. The chief previous drawback to high compression of being unable to prevent detonation or knocking, with its power losses, has been overcome by the use of premium grades of non-detonating fuels.

Engines of low compression may be changed into high-compression motors by shaving off the cylinder-block heads, by fitting new heads supplied by the manufacturers or by fitting longer pistons. Such work should be done only with proper engineering service advice.

One California truck operator with a fleet of nine heavy-duty trucks changed the engine compression ratios from 4.2 to 1 to 5.3 to 1 and with tetraethyl lead fuel reduced gasoline consumption approximately 20 per cent. This is equivalent to a saving of $\frac{1}{4}$ cent per mile, notwithstanding the 3-cent additional cost per gallon as compared with the ordinary gasoline used previously. Additional savings were indicated in fewer overhauls per year.

The engineering service offered to fleet owners in the food field in regard to engine lubricating oils and chassis oils and greases is equally as valuable as that previously described for engine fuels.

Recommendation charts are provided to assist in the selection of oils of different grades for lubrication of

GASOLINE AND OIL SUMMARY

BRANCH Main VEHICLE NO. 134

Change Oil at 23,300 (1,000 Miles); 24,339
Grease at 23,675 (500 Miles); 24,175

Day	Month of June: Gas Gals.	Oil Qts.	Mileage Reading	Route	Month of July: Gas Gals.	Oil Qts.	Mileage Reading	Route	Day
1	10	1	23,187	2	10	1	24026		1
2	10	1	-242	2	9	1	-075		2
3	6	1	-262	2	11	1	-125		3
4	7	2	-292	2	13	2	-180		4
5	11	1	R -320	3	14	1	-240		5
6	5	8	Ⓡ - 339	2					6
7	6	1	- 377	3					7
8	7	1	-402	2					8
9	10	1	-452	2					9
24	10	1	23,641	3					24
25	11	8	G - 681	3					25
26	15	½	Ⓖ - 724	3					26
27	12	½	-786	3					27
28	11	1	- 823	3					28
29	10	1	-875	3					29
30	10	2	- 925	3					30
31	7	2	24,001	3					31
Total Units	163	21	814						
Rate									
Total Cost									

A Gasoline and Oil Summary Sheet used in connection with Oil Change and Greasing Notice shown at right to control crankcase-draining and greasing periods. The R indicates the date when the Oil Change Notice was sent to the shop, and the encircled R, the date when the crankcase was actually drained.

OIL CHANGE AND GREASING NOTICE

The work indicated below must be done at once and this form filled out and returned to Main office

Date June 5th 193 Vehicle No 134

(Change oil in engine)	8 qts. added
Grease all chassis points	
Check rear axle grease	
Check gearset grease	
Wash clutch	
Date work done June 6th	Mileage reading 23,339
Work done by John Smith	O.K by foreman Wm. Brown

The Oil Change Notice covering the crankcase draining indicated above. A similar notice was sent for the greasing operations indicated by the symbol G, with the work done on the date with the G in a circle.

DAILY MOTOR VEHICLE REPORT

BRANCH Main DATE June 24 193

Truck No.	Route	Driver	Time Out	Time In	Mileage Reading Out	Mileage Reading In	Miles Run	Gals. of Gas Used	Oil (Qts.) Used	Oil (Qts.) Changed By
10	2	J. Smith	8:20	5:30	27,893	27,999	106	17	2	—
15	7	J. Brown	8:00	6:30	88,203	88,303	100	16	3	
18	9	J. Doe	7:58	3:30	14,827	14,852	25	4	8	F.D.H.
20										
24										
26										
29										
30										
31										
47										
49										
52										
53										
55										
60	28	K. Louds	7:52	4:32	107,843	107,907	64	10	2	
Totals								250	32	

DAILY SUMMARY AND INVENTORY OF GASOLINE AND OIL

	Gals. Gasoline	Qts. Oil	Qts. Alcohol		Gals. Gasoline	Qts. Oil	Qts. Alcohol
Gals. in Tank...A.M.	450	50		Used by Company Cars and Trucks	250	32	
Gals Added	350	25		Charged to Individuals or Depts.	20	2	
Total	800	75		Cash Sales	10	2	
On Hand by Actual Measurement ...P.M.	520	39		Total Accounted for	280	36	
Gals. to be Accounted for	280	36		Gas Pump Readings P.M.	25,183		
Accounted for by above Charges	280	36		Gas Pump Readings A.M.	24,873		
Difference	0	0		Signed K.C. Jones	280.		

A Daily Motor Vehicle Report showing at the bottom a method of obtaining a daily inventory of gasoline and oil in order to prevent theft or misuse of both products. Whenever the figure on the Difference line is not zero, it indicates a shortage, the reason for which should be determined at once.

different types of engines under average conditions. The engineering service offered is of particular value in modifying the selections recommended for average conditions to meet the particular conditions of any given fleet owner.

While there is still great divergence of opinion as to the relative lubricating qualities of engine oil made from the different bases of crude, it is customary to purchase oils on specifications including gravity; flash; fire; viscosity (Saybolt Universal) at 100, 130 and 210 deg. F.; pour; carbon content (Conradson); color; resistance to emulsion; neutralization and evaporation.

The above specifications are of great importance to the refiner in controlling the uniformity of the product, but in actual practice do not fully measure the real lubricating qualities of an oil. Actual service is the real test of the quality of a motor oil.

Many oil engineers consider the Navy Work Factor testing machine, illustrated on page 270, as giving the nearest approach to the lubricating service that will be obtained from an oil in actual operation. In that apparatus a motor oil under test indicates in a period of 100 hours the oil's characteristics as to stability and durability such as could be obtained only by an actual service run of 5,000 miles. Many fleet-owner oil purchasers are now requiring that the Navy Work Factor number be added to the specifications requested.

Generally speaking, a motor oil is considered to be of high quality if it has characteristics which include a high resistance to oxidation or sludging; a high viscosity index, which means that it does not thin out excessively under heat or thicken excessively when cold; low volatility and high flash point; low carbon content and high resistance to emulsion. Motor oils purchased by the U. S. Navy must have a work factor of not less than 0.60 after the 100-hour endurance test.

Because the average costs for motor oils are in the neighborhood of 1 per cent of total operating expenses, there are quite definite limits to which motor oil savings can be carried. Many food-field fleet owners have come to the conclusion that because of the comparatively small cost of motor oil, the highest quality oil at a fair price is the most economical by reason of its longer life and greater possibilities for reduced engine wear.

Besides the engineering service offered on motor fuels and oils, that on chassis oils and greases presents many opportunities for reduced expense in the selection and use of the proper lubricants. Exhaustive studies have been made in universal lubricants, chassis greases and lubricants for use in worm and hypoid gears.

Summarizing, the utilization of the engineering service offered, together with the use of uniform quality products, invariably results in a reduction in the amount of money spent for fuel and lubricants. But this is only

part of the savings possible, since proper fuels and lubricants properly applied will reduce maintenance cost, which is one of the largest items of expense, varying between 20 and 40 per cent of the total cost.

For example, when an engine is properly tuned up subsequent to an exhaust-gas-analyzer test, those factors which go to make proper performance are corrected, thus tending to reduce wear, correct compression, ignition and timing; renew faulty spark plugs; prevent valve leakage and excessive carbon formation. All these tend to reduce the cost of repairs and minimize road breakdowns that take trucks out of service unexpectedly.

Now the fleet owner in the food field must not assume that once the engineering service is utilized together with quality fuels, oils and greases, reduced fuel and lubricant expense and reduced maintenance cost will result without proper supervision on his part. First, some system must be provided to prevent loss of fuel and lubricants through theft or waste in handling.

One such system is shown in one of the two forms at the top of page 271. The key of this system is to take a daily fuel and oil inventory. Unless this is done, losses are likely to occur which cannot otherwise be traced.

Then, there is no economy in using a quality motor oil or chassis grease which gives a greater life if the lengthened oil-change and greasing periods are not maintained. A system for controlling these routines is shown in the Gasoline and Oil Summary at the top of page 271.

The fleet owner's system of running and shop maintenance must be such as to keep the trucks in fair mechanical condition. Engines that are badly worn use more fuel than those in good condition, no matter how high the quality of the gasoline.

Badly worn engines also use more lubricating oil, and, no matter how high its quality, it cannot replace metal in the sense that heavier oils can seal clearances when cylinders are worn or rings need replacement.

The use of oil filters and air cleaners also helps to maintain the lubricating oil in better condition than on vehicles without such equipment. Maintenance of proper brake adjustment, front-wheel alignment and tire pressures all help to increase fuel economy. If such factors are not correct, they create drags which make the engine work harder to overcome them and thereby use more gasoline.

Other operating methods under the control of the fleet owner which tend to increase fuel consumption unless they are corrected include an excessive use of the choke; excessive racing of the engine; tampering with carburetor adjustments; idling the engine at long stops; poor radiator protection in cold weather; too sudden acceleration and the use of low when higher gears might be employed with more skillful operation.

Accident Prevention Boosts Sales 2½ Million Units

This regular department, devoted to the important subject of motor transportation in the food industries, will be at its full two-page length in our August issue. Watch for it!

GENERAL BAKING CO. figures every accident a loss—which, of course, it is—but it calculates these losses to a basis that everyone in the company can easily understand. It states them in terms of extra loaves of bread which it is necessary to sell to pay for the accident and still earn the same amount as before. But, of course, no one can sell more of anything just because of an accident.

So, if an accident fails to occur during a period when the statistics show that it should be expected to happen, everybody in General Baking figures that the company's sales have been increased by the amount of bread equivalent to the cost of the accident. Thus if the safety experience record runs in one season at exactly the same rate as in the corresponding season in the previous year, then there should be expected to be the regular quota of fenders ripped off, representing possibly a value equivalent to the profit on 1,500 loaves of Bond Bread each, and so on. If the worst possible thing should happen, such as the loss of a human life, entirely aside from the more ethical and social values, it might represent a bread equivalent of 1,000,000 loaves.

Here is a method of visualizing the result of safety work in accident prevention which registers in the minds of everyone. Accidents prevented are as good as sales increases—better, in fact, for no ill-will is ever created by *failing* to have an accident.

To show how it has paid the group of men who comprise General Baking, the treasurer of the company recently issued a statement of considerable significance to employees. It refers, however, to plant as well as automotive experience:

"Does it pay to be safe? With the help of our Save and Sell Program, we sold 2,487,339 extra loaves of Bond Bread in six months of 1932, as the result of savings on Safety Always alone!"

How is it accomplished? Almost solely by education. Penalties are seldom charged up to a man unless his record shows that he is continually a careless individual, and he then parts company with the firm. The educational campaign has the backing of the entire executive and administrative group and is handled with a profound knowledge of human nature. Below is a quotation from a recent issue of their safety bulletin, "Safety Sun."

"Take your medicine.

"There is something wrong with a plant that has accidents. It's sick. The way to cure it is to find the cause—and then let the manager and his safety committee administer the medicine.

"The cause is easy enough to find in most cases. A great majority of plants have their chief trouble with backing accidents, in which the company automobile drivers are at fault. This type of accident is 100 per cent carelessness and can be eliminated!

"Just look what a lot of trouble these needless backing accidents are causing certain plants:

Percentage of Total Auto Accidents Due to Backing

	Per Cent		Per Cent
Hartford	23	Bronx	23
New Haven	41	Buffalo	18
Springfield	13	Syracuse	18
Waterbury	21	Phila. South	12
Jersey City	15	Phila. West	13
Newark	12	Allentown	22
Brooklyn South	10	Baltimore	20
Brooklyn East	11	Clevelnad	20
Louisville	16	Enid	66
Wheeling	26	Hutchinson	50

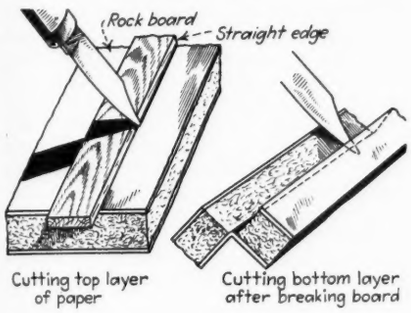
That such accidents can be greatly reduced is shown by the record at another plant, that at Philadelphia, North, where during 1932 there was only one backing accident, as compared with twelve in 1930.

IDEAS . . . FROM PRACTICAL MEN

Easy Way to Cut Sheet-Rock

Formerly, the best way to cut sheet-rock was considered to be with a handsaw. It was always a mean job, especially if the piece was a big one and the cut very long. The sheet-rock was very likely to crack or break in the operation.

Recently, we put in a temporary wall of sheet-rock, and the carpenter had a better way to cut it than by sawing. He used his pocket knife, drawing it along a straight-edge, cut-



ting only through the top layer of paper. This is easy if the knife is sharp. Then he bent the sheet back so that the sheet-rock broke square and sharp just at the cut in the paper. The paper on the back side was easily cut by the knife. In one minute it is possible to cut a piece that would take five minutes for sawing.

VIRGIL JOHNSON, *Buffalo, N. Y.*

How to Handle Kettles

There is no more awkward piece of equipment to handle around a plant than a round-bottomed, steam-jacketed kettle. Its center of gravity is all on one side and there is no good place to take hold.

We always turn our kettles upside down when we handle them—that is, if they are not too wide to handle that way. Sometimes a door or opening is too narrow to permit the passage of a kettle except on edge. Very small kettles are no job at all, but when you have a 500-gal. job it requires a lot of planning.

Kettles should be hoisted in place vertically by a rod or chain extending through the outlet boss, if the outlet is in the center of the bottom. The end should have a nut or a bolt to hold the kettle, but it should be wrapped in burlap to protect the threads on the outlet.

CARL E. STOVER, *Indianapolis, Ind.*

Right Way to Cut Belts

Last week, I saw a man cutting a piece out of a 5-in. belt. He took out his pocket knife and attempted to cut a line parallel to the end of the belt. After he laced it and put it back, the

belt wobbled so badly that it nearly ran off the pulleys.

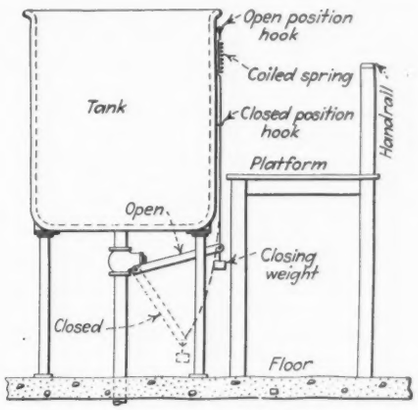
It seems incredible in this day that any superintendent would allow a belt to be cut in any way except exactly square. A try-square should always be used to mark the belt for cutting.

E. F. FUSON, *Cleveland, Ohio.*

Quick-Opening Valves

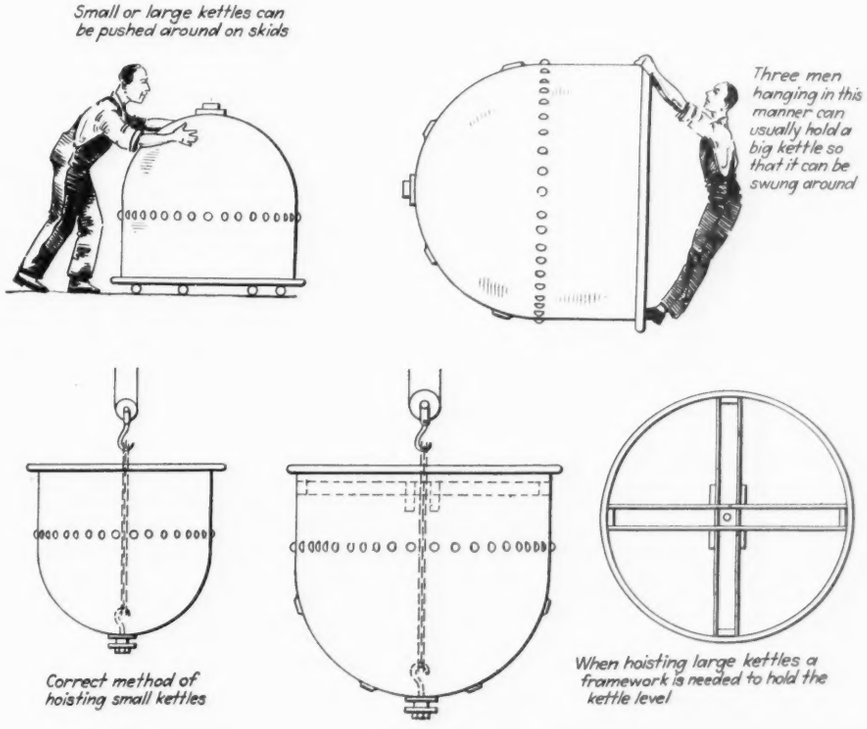
Quick-opening gate valves should nearly always be controlled in such a way that their closing action is positive and sure. Where they are on lines carrying valuable liquids, the levers should be weighted to insure prompt closing after they have been released.

One of our men has devised this method of opening and closing an



outlet valve by means of a rope, a weight and a coiled spring to give proper tension without jamming, when it is in the "up," or open, position.

A. MASON CRAIG, *Atlanta, Ga.*


Small or large kettles can be pushed around on skids
Three men hanging in this manner can usually hold a big kettle so that it can be swung around
Correct method of hoisting small kettles
When hoisting large kettles a framework is needed to hold the kettle level

NEED MONEY?

Subscribers submitting practical ideas will receive $3 to $10 for each item published. Put your idea into a short letter and send an explanatory sketch.

—The Editors.

NEW BOOKS

PHYSIOLOGICAL EFFECTS OF RADIANT ENERGY. By Henry Laurens. American Chemical Society Monograph No. 62. Published by Chemical Catalog Co., Inc., 330 West 42d St., New York, N. Y., 1933. 610 pp., 6¼x9¼; illustrated; cloth. Price, $6.

TO the research worker, this volume will be of great value. It is a digest of the world's scientific literature on the subject of the physiological effect of radiant energy. The digest proper is preceded by an exhaustive discussion of the physics of radiant energy, a thorough knowledge of which is a necessary prerequisite to any successful investigations in this field. To those who contemplate use of this volume as a starting point, it should be pointed out that it makes no reference to the physiological effects of ionized air, which constitutes an uncontrolled or unexplained variable in many experiments in irradiation. An excellent bibliography is appended.

Faddists who like to indulge in excessive exposure to sunshine or to ultra-violet sources such as lamps will do well to read this book before they attempt to impose their views upon others.

MODERN CONNECTORS FOR TIMBER CONSTRUCTION. Prepared jointly by the National Committee on Wood Utilization, U. S. Department of Commerce and the Forest Products Laboratory, Forest Service, U. S. Department of Agriculture. Published by U. S. Government Printing Office, Washington, D. C., 1933. 147 pp., 5⅞x9⅛; paper; illustrated. Price, 15c.

FOOD manufacturers contemplating plant additions or changes will find the 24th report of this committee's series of value. It deals with the devices used to increase the efficiency of timber joints by the transmission of load from one wooden structural member to another. Besides a history of the development of such efficiency aids, detailed descriptions of the various types and their modifications are included. The booklet points out economies in construction cost of warehouses, loading platforms, and similar wooden structures.

FOOD PREPARATION. By Marion Devoe Sweetman. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York, N. Y., 1932. 344 pp., 6¼x9¼; illustrated; cloth. Price, $3.

COMMERCIAL processors of food who are interested in the science of their production will find such a textbook as this stimulating and valuable. It discusses food preparation on the basis of the physico-chemical structure of materials used and the organic chemical and biochemical principles incorporated. The food-plant man should find interesting material in the chapters on cereals, milk, fats and oils, meat and allied foods, sugars, frozen mixtures, and flour mixtures.

THE GROCER'S ANSWER BOOK. Prepared by Grocery Trade Publishing House, 755 North Central Ave., Chicago, Ill., 1933. 64 pp., 5x7⅝; illustrated; paper. Price 50c.

HERE is a booklet that may serve as an index of the information a food manufacturer should furnish his retailers that they may answer the many questions which purchasers are likely to ask. It will serve as well the buyers whose cuisine demands a variety of foods, for there are replies to queries about edibles from allspice to zweiback.

ANNUAL SURVEY OF AMERICAN CHEMISTRY. Edited by C. J. West. Published for the National Research Council by Chemical Catalog Co., Inc., 330 West 42d St., New York, N. Y., 1933. 341 pp., 5½x8½; cloth. Price, $4.

THE seventh volume of this annual survey is now available. It summarizes more briefly than formerly, but still fully, the research findings in chemistry during 1932. There are separate sections on colloids, foods, water, fermentation, and sewage and trade wastes. Food preservation, gels, alcohols, and trade wastes are selected topical headings of considerable interest to food manufacturers. In the discussion of trade wastes particular attention is given to the treatment of milk wastes by filters and the activated sludge process.

BAKERY SCIENCE. By J. E. Driver. Published by Oxford University Press, 114 Fifth Ave., New York, N. Y., and London. 186 pp., 5⅛x7⅞; illustrated; cloth. Price, $1.75.

WITH the needs of the baker and confectioner in mind, this volume supplies the general science principles incorporated in recently developed methods and in ingredients in new forms. The first part outlines briefly certain elementary principles of chemistry, physics and biology, and the second half applies them to the established practice in the bakery. It is of particular interest to the young baker or candy maker who wants a technical understanding of his materials and production operations.

FOOD PRODUCTS DIRECTORY OF THE PACIFIC COAST AND ROCKY MOUNTAIN STATES. Published by W. J. McCammon, 1202 Hearst Building, San Francisco, Calif. 367 pp., 6¼x9⅜; cloth. Price, $6.50.

IN this annual guide book is the answer to many requests for information on canners, packers and manufacturers of food products; packers and shippers of fresh and dried fruits; and dealers in nuts and beans. It furnishes also a classified list of firms in lieu of a buyers' guide and business directory.

THE PROGRAM FOR THE WORLD ECONOMIC CONFERENCE. Published by World Peace Foundation, Boston, Mass., 1933. 93 pp., 5⅜x8; cloth. Price, $1.

MANUFACTURERS all over the world await rather anxiously the developments arising from the sessions of the current international conference on economics and the final settlement of major problems. As is pointed out here, particular attention is given to prices, tariffs and treaties, international trade restrictions, and the organization of production and trade. The outcome of such broad topics undoubtedly will affect not only industry in general but each type of productive enterprise.

VALUE THEORY AND BUSINESS CYCLES. By H. L. McCracken. Published by Falcon Press, 330 W. 42d St., New York, N. Y., 1933. 270 pp., 6x8¾; cloth. Price, $4.

THERE is no economic topic of more importance to industry than the business cycle. It accounts for prosperity and depression of consumer and producer alike. In explanation of the cyclical nature of business, the author points out the intrinsic relation of the business cycle theory and the value theory. He supports Malthus and his "commanded value" theory, showing that Malthus is the logical starting place in considering the business cycle. He ends his book with a section on business equilibration and the means necessary to the correction of business instability.

EXPERIMENTAL COOKERY. By Belle Lowe. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York, N. Y., 1932. 498 pp., 6¼x9¼; illustrated; cloth. Price, $4.50.

WHETHER in the kitchen or in the factory, preparation of food means application of scientific principles, especially those of chemistry. In fact, as Miss Lowe points out, good preparation may be termed one field of applied colloid chemistry. Its basic principles, therefore, are applied to sugar cookery, freezing, emulsions, batters and doughs, gelatine and other subjects of equal interest to food processors. The illustrative material aids considerably in the understanding of the subject matter.

AGRICULTURAL RUSSIA AND THE WHEAT PROBLEM. By V. P. Timoshenko. Published jointly by the Food Research Institute and the Committee on Russian Research of the Hoover War Library, Stanford University, Calif., 1932. 571 pp., 6¼x9; illustrated; cloth. Price, $4.

AMONG the many books on Russia since 1922, few have had the advantage of historical perspective as has this discussion of present agricultural conditions. It traces the development of agricultural, particularly grain production after 1900, its decline during the war and revolutionary years, and its recovery during 1922-29. Perhaps the most important point which it makes is that Russian agriculture is in transition between small-scale individual cultivation and large-scale state-farm or collective cultivation. With official recognition of Russia a strong possibility the importance of Russia as a wheat exporting nation again becomes a subject of present-day interest.

ABSTRACTS OF
Current Literature

ALUMINUM FOIL AS A WRAPPING MATERIAL FOR CUT BREAD. *K. Seidel, Zeitschrift für Untersuchung der Lebensmittel,* Vol. 65, 104-106; January, 1933.

Aluminum foil is used in Germany as a wrapping material to preserve the flavor of cut bread, especially pumpernickel and "dark" bread. The quality of this foil is tested by the action of acid solutions on the foil and by correlating these tests with observed effects when the foil is used for packing bread. The method is as follows: 40 sq.cm. (5x8 cm.) of the foil is exposed to the action of 100 cc. of 0.5N. lactic acid at 20 deg. C. A suitable foil should not lose more than 10 mg. per 100 sq.cm.

IODINE IN THE DIET. T. von Fellenberg. *Chemisch Weekblad,* Vol. 30, pp. 250-258; April 1, 1933.

There are various expedients for introducing iodine into the normal diet for the prevention and treatment of goiter. Some doubts have been expressed about the safety of using "iodine salt"—table salt containing iodines. As a matter of fact, much larger quantities of iodine are administered in other ways without harm, and there is no valid evidence of adverse effects arising from the use of "iodine salt." The iodine content of milk can be notably increased by feeding certain feeds; and cows which are pastured near the seashore customarily give milk which is relatively rich in iodine. Vegetables such as spinach, carrots and beets can be made rich in iodine by fertilizing the soil with materials containing iodine and by adjusting the soil acidity to a point at which it favors iodine assimilation by the plant. Fresh-water plants contain more iodine than land plants; marine plants contain still more. Similarly, fresh-water fish and animals contain more iodine than land animals, but marine fish and animals contain still more; hence the well known value of a sea-food diet in the prevention and cure of goiter. In estimating the iodine value of a food product for dietary purposes, however, it must be remembered that quantity of iodine is not a sufficient criterion, because different foods differ in the assimilative properties of their iodine content, and it is only the assimilated iodine which is effective.

IRRADIATED ERGOSTEROL AND ALCOHOLIC FERMENTATION. P. Pirrone. *Annali di chimica applicata,* Vol. 22, pp. 731-737 (1932). [From *British Chemical Abstracts,* A, p. 326; March, 1933.]

Preliminary experiments indicate the possibility of correlating the antirachitic effect of irradiated ergosterol with its influence on the quantity of carbon dioxide formed during fermentation of glucose.

MILK. J. Straub. *Chemisch Weekblad,* Vol. 30, pp. 343-344; May 13, 1933.

The Bureau of Tests in Amsterdam made a study of the sources of error in measuring the freezing point of milk and found that the variable causing most of the difficulty was the quantity of ice in the milk when the readings are taken. Proper control of this factor and rapidity in making the measurements by the short method enable different observers to agree within a few thousandths of a degree. A study also was made of bacterial examination as a criterion of the care with which milk has been produced and handled. Milk insufficiently cooled, or kept too long, decolorizes methylene blue readily because of increase in the natural bacterial content. Faulty production methods, on the other hand, reveal themselves in the *B. coli* count. As *B. coli* is an organism that does not occur naturally in milk, its presence is certain evidence of contamination of the milk with stable filth or the like. Records for Holland show improvement in recent years.

CANNED SARDINES. Gulbrand Lunde and Erling Mathiesen. *Tidsskrift for Hermetikindustrie,* Vol. 19, pp. 87-93; March, 1933.

Average calorific value per 100 grams (about 4 oz.) of sardines in tomato sauce is 202; for the fresh sardines, 175; smoked, 225; canned in oil, drained, 250; in oil, whole contents of can, 340. Smoking causes a slight increase both in fat content and in salt content. A curve based on tests made immediately after smoking showed the relation between fat content in fresh and smoked sardines to be nearly a straight line. In cannery practice the smoked sardines are dried for a time before being packed in oil.

NEW BAKING ADULTERANTS AND THEIR DETECTION. *Hans Diller-Bautzen. Zeitschrift für Untersuchung der Lebensmittel,* Vol. 64, pp. 532-540; December, 1932.

The tendency toward lowered prices in the present depression has apparently led to a lowering of quality in baking materials and to the use of substitutes or adulterants. The question arises whether such substitutes are allowable, and under what conditions. A number of such substitutes have been examined, and certain tests for detection as well as the properties of these substances have been studied. They are: soya-bean meal, rice meal, rye and potato meal, "Eigoldin" (a commercial preparation, apparently merely a 15 per cent solution of egg albumin), "Heliocithin" (a commercial preparation, apparently some sort of egg oil, showing same fat and lecithin-phosphoric acid content as egg yolk), and "Soya-lecithin" (extracted from soya meal and mixed with soya oil for handling).

VITAMIN A. P. Karrer, R. Morf and K. Schöpp. *Helvetica Chimica Acta,* Vol. 16, pp. 557-561; May, 1933.

Chemical studies of the vitamin A from cod liver oil led, in 1931, to the conclusion that this vitamin is a trimethylcyclohexene derivative of a certain unsaturated aliphatic alcohol. Strong confirming evidence that this conclusion is correct has now been obtained by an actual chemical synthesis of perhydro-vitamin A, a direct reduction product of the compound which is now considered to be vitamin A. The synthetic product is identical in all its properties with the perhydro-vitamin A made by catalytic hydrogenation of the pure vitamin from cod liver oil. There is a possibility that the purest natural vitamin A is a mixture of closely related isomeric compounds; but the chemical structure of the major component may now be considered as proved. It is interesting to note that the raw material for the synthesis of perhydro-vitamin A was beta-ionone, a component of artificial violet perfume.

ENZYMES IN MILK. P. Parisi. *Giornale di chimica industriale ed applicata,* Vol. 15, pp. 119-123; March, 1933.

Enzyme activity in milk is intimately related to the quality of the milk, being directly involved in both rate and kind of spoilage. It is important to differentiate between the enzymes actually belonging to the milk and those which are introduced by bacterial activity. For this reason a careful study was made of the enzymes in fresh milk, mixed milk from different cows, and commercial dairy milk. It was found that there is a specific enzyme in milk and colostrum; it is different from the enzymes arising from the bacterial flora of milk, and also from the enzyme in cow blood. Comparative measurements of the catalytic effects of the enzymes on the decomposition of hydrogen peroxide showed that the velocity coefficient of the reaction, under specified conditions, is 0.1 to 0.12 for the true milk enzyme and 0.19 to 0.21 for the bacterial enzymes in milk. It also was found that the velocity constant of hydrogen peroxide decomposition can serve as a criterion for judging the keeping quality of milk; no milk in which this coefficient is above 0.15 should be allowed to be sold, because it has progressed as far toward spoilage as a milk which has stood 19 hours at 15-17 deg. C. Commercial dairy milks, if properly handled, do not exceed the specified limit.

SWELLING OF GLUTEN IN ACID SOLUTION. E. A. Fisher and P. Halton. *Chemistry and Industry,* Vol. 52, pp. 91T-97T; April 7, 1933.

Previous workers have stated that a glúten swelling test could replace baking tests in the mill for controlling regularity of flour quality. Test is made by isolating the gluten from two flours, placing the gluten in an acid solution at 25 deg. C. and measuring the gluten volume at half-hour intervals. Results obtained by the authors do not substantiate earlier claims of Berliner and Koopman. The conclusion is that the baking test cannot yet be replaced safely by any single chemical or physical test.

NEW PRODUCTS—

—NEW METHODS

Whips Honey to Cream It

"All the valuable essences and aldehydes that give honey its soul" are contained in the Kreme Whipt Honey, introduced by Mountain States Honey Producers' Association, Boise, Idaho. Representing another addition to the rapidly growing list of foods from the beehive, Kreme Whipt is prepared by a patented process which involves whipping the honey as it crystallizes. The product is of creamy consistency and has a full honey flavor, making it an ideal spread for hot breads. It is also recommended for use on dry cereals and prepared breakfast foods.

"Anti-Ranc" Green Liner

Rancidity is held to be effectively combated in the "Anti-Ranc" paper bag, used by Jack Sprat Foods, Inc., Marshalltown, Iowa, for salted peanuts and by Wedding Breakfast Coffee Co., Denver, Colo., for coffee. By means of a green paper lining the band of light recently discovered to affect rancidity is filtered out. At the same time, the liner makes the bags moisture-proof and airtight. The bag is manufactured by Benj. C. Betner Co., Devon, Pa.

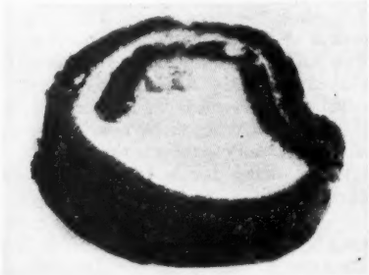
Bridge Party Confection

"Hearts and Spades" are now the major suit with Eatmor Chocolate Co., Pittsburgh, Pa. As the name suggests, this new product is a confection devised particularly for bridge parties. However, it will be marketed the same as any other confection. Hearts and Spades comprise an assortment of panned confectionery. The candy is packaged in a laminated tube, and the labor cost for labeling is eliminated by printing the label on the paper from which the tube is wound.

Coupons provide an added attraction for the new confection. Slips bearing the letters of the name "Eatmors," one letter on each slip, are placed in the 5-cent tubes. When the consumer has all the letters in the name, he receives a tube of Eatmors free. With six complete sets of letters, the premium is a 5-lb. box of milk chocolates.

Quix-A-Wink in Cartons

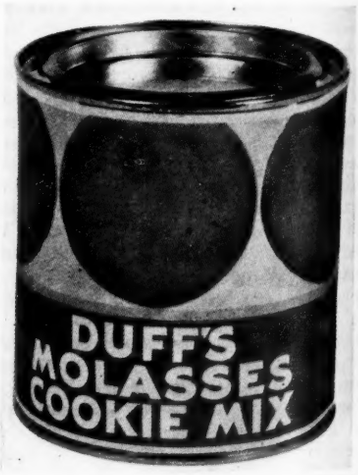
Federal Mills, Inc., Lockport, N. Y., has done away with the time-honored flour sack for its Quix-A-Wink self-rising flour. This product is now being packaged in 2½-lb. cartons and is wrapped in transparent cellulose to enhance its keeping qualities. An all-purpose mixture, Quix-A-Wink contains wheat flour, salt and baking powder.



Ice Cream and Cake Roll

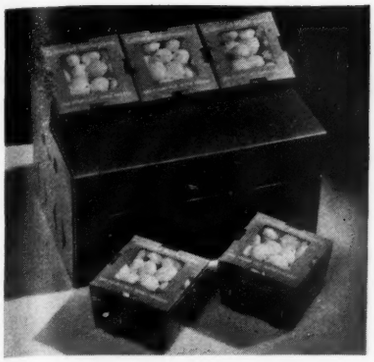
Ice cream and cake, the traditional summer dessert combination, have been united as one. The large Fifth Ave. plant of Reid Ice Cream Corp., New York, now produces ice cream rolled up in a layer of cake. The product is made by spreading the ice cream in a uniform layer over a rectangular slab of chocolate sponge cake and rolling it up by hand. The roll is then wrapped in paper and sent to the hardening room. Some of the rolls are sliced and packed in paper bags; others are sliced as sold.

In making the product, the manufacturer must use a cake that does not become soggy when it comes in contact with the ice cream mix. Another production factor enters in the hardening room, where the cake acts as a high-quality insulator and necessitates a much longer exposure at the low temperature.



Prepared Cookie Mixture

Flour and warm water are the only ingredients required for making soft cookies when the flour is Duff's Molasses Cookie Mix, prepared by P. Duff & Sons, Pittsburgh, Pa. The cookies can be baked in 10 to 12 minutes. The new mix is the sixth product of this type made by the company. Duff only recently introduced a fruit cake mix, spice cake mix and a devil's food mix.



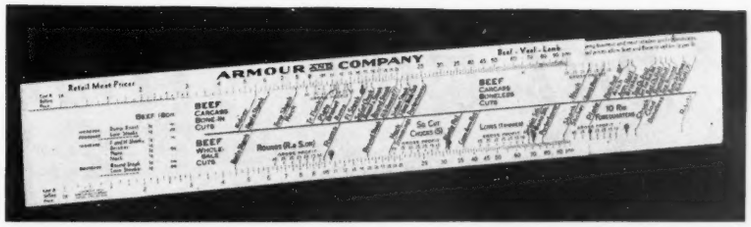
Expanding Mushroom Carton

In Eastern markets, mushrooms have joined the ranks of fresh vegetables packaged in showcase cartons. Not only do the cartons display the mushrooms but they expand to permit their contents to take on an increase in volume. Packaging mushrooms has been somewhat of a problem, since they grow almost 10 per cent in bulk within 24 hours after being packed. A green paperboard shipping case accommodates one dozen of the 1-lb. packages. Robert Gair Co., Inc., developed the containers.

Another expanding package recently made its appearance as a container for the unbaked yeast dough produced by Schulze Baking Co., Chicago. Made of two cardboard cylinders, one within the other, this package permits the dough to expand by 100 per cent.

One-Service Flavor Bottles

To prevent loss of flavor after the seal is broken, Smile Syrup Co., St. Louis, Mo., is offering flavor concentrates in 2½-oz. bottles to soda-fountain proprietors. Each bottle of flavoring, when mixed with 6 lb. of sugar and ½ gal. of water, makes 1 gal. of syrup for fountain use. The bottle is a miniature of the beverage bottle used by the same company and is manufactured by the Owens-Illinois Glass Co. Its small size allows the preparation of a relatively small quantity of syrup.



Slide Rule Computes Prices

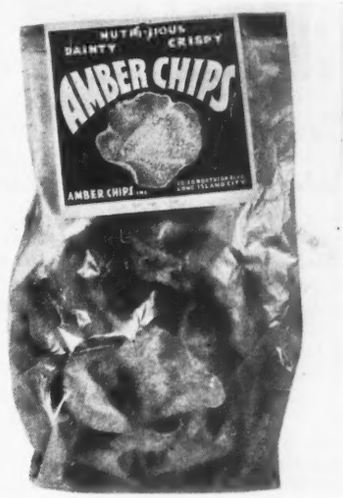
Retail dealers can now determine easily and quickly how much to charge for a porterhouse steak, veal chop or lamb kidney—and still realize a desired gross profit. It is done with a celluloid slide rule distributed to customers by Armour & Co., Chicago, Ill. It decides the question for cuts of beef, veal and lamb, whether bone-in or boneless, whether whole carcasses or wholesale cuts. The same type of rule can be used to determine the proper selling price of ham or bacon, eggs, cheese, butter and other products. It is copyrighted.

Oil-Mixer-Recipe in One

To make it easy for the cook to prepare her own mayonnaise, Wesson Oil & Sales Co., Bayonne, N. J., has introduced a combination package which incloses a mayonnaise mixer with a pint of oil. The mixer, comprising a glass jar with a metal cap and plunger for whipping, has a recipe for mayonnaise embossed on its side. With it, says the distributor, home-made mayonnaise dressing can be produced in 90 seconds.

Soybean Now a Confection

Once considered a food fit only for animals, the soybean has risen within the last few years until it is now being eaten as a confection. May Val Products, Inc., Chicago, has perfected a line of Man Chu confections, the chief ingredient of which is the soybean. This line includes the Soy Boy Honey Bar, Nutty Krackles and Nutties. The first is made of soybean, pure honey and natural fruit flavor, coated with milk chocolate. Nutty Krackles consist of soybeans, a nutty mixture and chocolate. The Nutties comprise toasted, salted soybeans. Man Chu confections, while not offered as medicines, are said to be of medicinal value to such ailments as diabetes, acidosis, nerve disorders, stomach ulcers and fevers. They are non-fattening, being high in protein contents and exceptionally low in carbohydrates, and they are rich in vitamins.



Chips Are Sweet and Salty

Yams are making a bid for a share of the beer-inflated potato-chip business in the form of Amber Chips, manufactured by Amber Chips, Inc., Long Island City, N. Y. They were introduced by Charles & Co., grocers, New York, N. Y. Packed in a transparent cellulose wrapper, the package resembles that containing ordinary Irish potato chips. The chips themselves resemble those from the common spud, but the flavor is different.

Garden Peas Preferred

Pale-faced peas of the gray-green canning varieties are not as suitable for commercial freezing as are the high-quality market garden varieties, according to the New York State Agricultural Experiment Station. The canning varieties do not make as attractive a pack as do the large-seeded market garden peas with their bright emerald green color. Varieties which have proved especially well suited to quick-freezing include Thomas Laxton, gradus and telephone.

Among corn varieties tested at the station, good strains of evergreen, crossgreen, red evergreen and golden bantam made especially attractive and fine-flavored frozen products, both as cut corn and on the cob.

These quick-freezing experiments were carried out in cooperation with Frosted Foods Corp.

What Food Men Are Doing

G. G. HOSKINS
Heads Macaroni Manufacturers

Federation Announces Code At Chicago Meeting

More than 400 members of the industry attended the convention of Millers' National Federation in Chicago, June 21-22. Discussion of the farm adjustment legislation, a review of the present low level of flour exports and a speech by Secretary Wallace high-spotted the program. It was pointed out that the organization had opposed enactment of the Farm Bill, believing it unsound, but the millers will cooperate fully with the administration and have drawn up a set of trade rules.

Mr. Wallace asserted that the government does not want to dictate to industry but desires to aid manufacturers by insisting on fairness to all. He predicted that, unless the great wheat-producing countries adopt corrective measures, the United States might have to resort to world dumping.

A. J. Weaver, economic wheat adviser of the administration, answered questions on the recent legislation.

A. E. Mallon, speaking on the economic picture, stated that flour exports for 1932-33 will be under 4½ million barrels, the lowest in nearly 60 years and 68 per cent below the average. Wheat exports will be down 84 per cent. Mr. Mallon told the association that European bakers are finding that by changing their formulas they can get along without our flour.

The code adopted by the millers provides for the licensing of processors, outlaws shipments to the trade on consignment, eliminates rebates and "commercial bribery," precludes sale below cost plus expenses plus profit, and establishes a conversion factor of 4.6 bu. per barrel. It also provides that minimum selling basis include a conversion charge of not less than 60 cents a barrel.

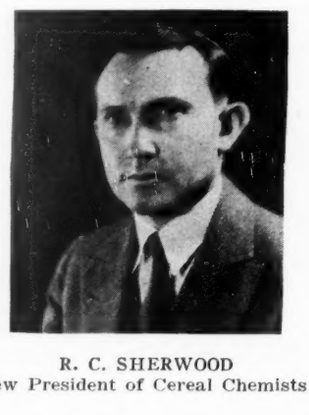
Fred J. Lingham, Federal Mills, Inc., Lockport, N. Y., succeeded Frank Hutchinson as president. Other officers include Jesse B. Smith and Richard P. Johnson, vice-presidents; George Livingston, executive vice-president; Herman Steen, secretary; Herman Fakler, Washington representative.

Macaroni Group Convenes

Activities at the 30th annual convention of National Macaroni Manufacturers' Association at Chicago, June 19-21, centered chiefly on the Farm Relief and National Recovery legislation. A code of fair competition was discussed, but the details will not be made known until the code has been passed upon in Washington.

Considerable attention was given also to conditions within the industry. One speaker pointed out the failure of high-pressure salesmanship at the present time; another stated that increase in consumption depended on educating the consumer to the value of macaroni. Still another held that the future depends largely on cooperative advertising, since in the depression years the products adequately publicized suffered least.

The beneficial effect of the proposed Food and Drugs Act was discussed by J. O. Clarke, Chief of the Central Division of Food and Drug Administration.



R. C. SHERWOOD
New President of Cereal Chemists

CONVENTIONS

JULY

6—Mid-West Shippers' Advisory Board, quarterly meeting, Palmer House, Chicago, Ill.; also Peoria, Ill. A. W. Wilkins, secretary, 59 East Van Buren St., Chicago, Ill.

12-14—National Confectionery Salesmen's Association of America, annual meeting, Baltimore, Md. Henry K. Michaels, secretary, 282 Northern Ave., New York, N. Y.

AUGUST

8-11—International Apple Association, annual meeting and exhibit, Palmer House, Chicago. R. G. Phillips, secretary, 1108 Mercantile Bldg., Rochester, N. Y.

11—National Malt Products Manufacturers' Association, quarterly meeting. S. L. Goldman, secretary, 160 North LaSalle St., Chicago. (Meeting also in New York.)

14-16—Bakers' Association of the Carolinas, Charleston, S. C. C. B. Graeber, secretary, 1013 Commercial Bank Bldg., Charlotte, N. C.

21-23—National Food Distributors' Association, Hotel Sherman, Chicago, Ill. E. J. Martin, secretary, 110 North Franklin St., Chicago.

FRED S. LINGHAM
Made President of Millers' Federation

The man chosen to lead the association into the new industrial era is G. G. Hoskins, Foulds Milling Co., Libertyville, Ind. Other officers are: Louis S. Vagnino, Foss Macaroni Co., St. Louis, Mo., vice-president; and M. J. Donna, editor of *Macaroni Journal*, secretary-treasurer.

Membership in the association has increased 200 per cent in the past year, representing 90 per cent of the productive capacity east of the Rockies.

Chemists Meet With Millers

Cereal chemists and operative millers met in Chicago in joint session at the Hotel Sherman on the evening of June 7 as part of the 19th annual convention of the former group and the 38th meeting of the latter one. More than 350 were present. Previous meetings of each group were for the discussion of general and particular problems of the industries and for presentation of technical papers on certain important phases of manufacture.

R. C. Sherwood, General Mills, Inc., Minneapolis, was elected president of the Association of Cereal Chemists; Mrs. Mary M. Brooke, Purity Bakeries Corp., Chicago, vice-president; M. D. Mize, Omaha Grain Exchange, secretary-treasurer. D. A. Coleman and C. C. Fifield, Washington, D. C., were reelected editor-in-chief and managing editor, respectively, of *Cereal Chemistry*.

F. L. Talmage, Ismert-Hincke Milling Co., Kansas City, Mo., became the new president of the Association of Operative Millers; Leonard Carmichael, National Milling Co., Toledo, vice-president; H. H. Trapp, Russell-Miller Milling Co., Buffalo, treasurer.

Flavoring Men Meet

Wage scales, working hours per week and other labor conditions will be worked out by a committee appointed at the 24th annual convention of the Flavoring Manufacturers' Association at Chicago, June 19-21. The data will be

used as the basis for a plan of operation by the industry under the Industrial Recovery Bill for submission to the executive committee. A trade practice code also will be prepared.

Officers reelected include: B. H. Smith, president; W. F. Meyer and G. M. Armor, vice-presidents; and F. L. Beggs, treasurer. Newly elected officers are: C. C. Nowland, Geo. H. Nowland Co., Cincinnati, vice-president; and E. L. Brendlinger, Dill Co., Norristown, Pa., secretary. Of the 250 members of the associaiton, 108 registered at the convention.

Candy Industry Divided Into Fourteen Zones

Establishment of machinery through which the association may aid the industry in complying with the provisions of the recovery legislation was the principal action of the 50th annual convention of the National Confectioners' Association at Chicago, June 20-23. To provide for wider activities, amendments to the bylaws were passed. An innovation of the convention was the production forum, held twice, during which papers dealing with raw materials were read.

An industrial recovery division will be organized and operated under the supervision of the president. It consists of an industrial planning committee, an industrial board and a managing director. The fourteen members of the industrial planning committee are selected from the fourteen geographical zones into which the manufacturers are grouped. This committee selects the five members of the industrial board for one-year terms, which in turn acts as an executive body to appoint necessary committees, to supervise the managing director, which it elects, and to decide the action necessary to the operation of the industry in accordance with the Industrial Recovery Act. The managing director is to serve one year.

A resolution was adopted stating the desire and intent of the association to comply with the labor provisions of the act, and a list of eight suggested rules for improving trade practices was approved for incorporation in a trade practice code.

The new officers are: G. H. Williamson, General Candy Corp., Chicago, president, and C. W. Douglas, Douglas Candy Co., St. Joseph, Mo., vice-president. J. M. Gleason, W. F. Schrafft & Sons Corp., Boston, was reelected. There were 1,550 members of the industry registered at the meeting.

Syrup Group Plans Code

Labor conditions in the industry will be studied by a committee named by the National Association of Manufacturers of Fruit and Flavoring Syrups, which met at Chicago on June 22. Data on wages, working hours per week and employment will be collected and submitted to the association for approval and then passed to federal authorities. A trade practice code will also be worked out, but not until the labor plan has been accepted.

Officers elected at the convention are: D. F. Bowey, Bowey's, Inc., president; Hugh S. Nesbitt, Nesbitt Fruit Products Co., Los Angeles, vice-president; S. M. Voorsanger, Lyons, Magnus Co., San Francisco, secretary; and W. T. Hankey, Cleveland Fruit Juice Co., Cleveland, treasurer. Thirty-five of the 45 members of the association attended the meeting.

Trade Associations Prepare Fair Competition Codes

Since the enactment of the Industrial Recovery and Agricultural Adjustment measures, food trade associations have been much occupied with the working out of codes of fair competition. Many associations have met to discuss the possibilities of control within the industry; some have drawn up tentative codes for submission to their members; and a few have drafted codes for presentation at Washington. Special attention was given to the dairy industry at a conference in Washington called recently by the Secretary of Agriculture and the Agricultural Adjustment Administration. Representatives of the producers, distributors and processors of fluid milk, evaporated milk, ice cream, butter, cheese and powdered milk attended discussions of plans and policies of the administration and department in applying relief measures to the dairy industries.

The fundamentals of a trade agreement, covering the marketing of swine, have been prepared by the American Institute of Meat Packers, representing the greater part of the packing industry, for approval by the Adjustment Administration. The packers propose increased long-range hog prices, and are willing to accept a fixed price system. It is hoped that total tonnage of swine may be diminished through premiums for middle-weight hogs. The meat dealers' code of trade practice includes seventeen recommendations for the elimination of unfair, wasteful and uneconomic

Hors d'Oeuvres

A BROOKLYN concern is baking bread by high-frequency radio apparatus. Being baked from the center out, the bread has no crust. The world has looked long for a painless way to eliminate heels.

•

WHEN a barge loaded with molasses was wrecked in Mohawk River, recently, thousands of fish were killed. The State Conservation Department said their gills had been stuck together. It all sounds much like the old fisherman's method of baiting the fish with Horseshoe plug and hitting them over the head when they come up to expectorate.

•

NEW YORK STATE farmers who sell 0.5 plus cider to motorists must pay the brewers' license fee of $2,500 a year. Did someone say something about farm relief?

•

"NO BEER no business," say officials of Falstaff Brewing Corp., in St. Louis. In other words, equipment and supply manufacturers in those states that have no beer will have no part of Falstaff's orders.

•

FRANK X. SCHWAB, who as Mayor of Buffalo, was a leader against prohibition, will manufacture beer at East Buffalo Brewery. Here's one man who practices what he preaches.

•

MAJOR THOMAS G. LANPHIER, famous war flyer, has become president of a New York brewery. His life is just one hop after another.

•

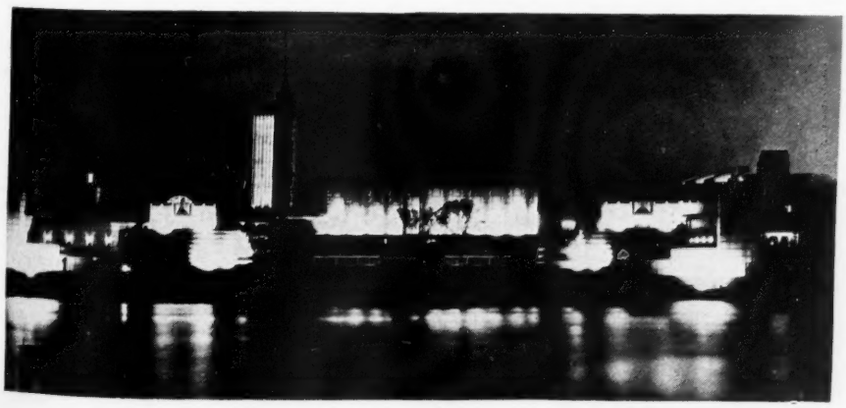
A LIFE a day has been saved in New York City by legalized beer, states Health Commissioner Wynne. How about a slogan, "a beer a day keeps the bier away?"

•

FIVE-YEAR-OLD whiskey can be made in six months with highly activated carbon, according to Industrial Chemical Co. That's nothing. For 13 years bootleggers have been making five-year-old whiskey in the time it takes to print a label.

•

COFFEE flakes that permit uniform and rapid extraction are covered in a recent patent . . . Salmon wieners have been introduced by a firm in Oregon . . . An English company is packing peeled potatoes in bottles.



Light on Science

The East view of the Hall of Science at A Century of Progress at night. Here a half dozen food companies' exhibits tell the scientific story of as many products. The exhibiting companies include Gerber Products Co., W. E. Long Co., Vitamin Food Co., Inc.; Standard Brands, Inc.; National Sugar Refining Co. (New Jersey), and Victor Chemical Works.

practices among retailers, wholesalers and packers.

The code drafted by the evaporated milk manufacturers for early submission to the Secretary of Agriculture includes a scale of selling prices to wholesale distributors and trade practice limitations. It sets minimum prices for milk and defines the separate functions of those who handle evaporated milk.

The purposes of the proposed code of the National Preservers' Association are: to increase employment and wages, to reduce labor hours, and to eliminate unfair trade practices. The code defines the status of labor; discusses sales and costs; and outlines price guarantees.

Seven national food industry groups united recently in a conference to discuss a master code of business ethics for the entire grocery industry. Leaders of the groups represented started at once to prepare codes, later to be compared and combined into a master code for submission within the next month to the administration.

Other industries, such as the ice cream industry, confectionery, canning and rice growing, have formulated tentative codes which they are submitting for approval or change to all members of the respective industries.

Codes drawn up by associations which met at Chicago in June are discussed under separate heads.

Salad Dressing Defined

Middle Western salad dressing manufacturers, meeting under the auspices of the Mayonnaise Institute, in Chicago, recently drew up the following definition of salad dressing: " . . . the wholly or partly cooked or boiled semi-solid emulsion of edible vegetable oil, egg yolk or whole egg, a vinegar and/or lemon juice, with one or more of the following: salt, other seasoning commonly used in its preparation, sugar and/or dextrose, starches, and without artificial color. The finished product contains not less than 35 per cent by volume of edible vegetable oil."

This standard is to be submitted to all manufacturers in the industry for approval or suggested changes.

Bakers Must Wrap Bread

Bread products must be wrapped in paper before removal from bakery buildings in Connecticut, unless they are being delivered in closed sanitary containers to a branch of the bakery or to hotels, restaurants or institutions. Such is one of the provisions of the recent amendment to the state bread-wrapping law. Another provision is that bread, rolls, buns and other bread products must be sealed as well as wrapped. As the state Dairy and Food Commission interprets the amendment, twisting of the top of a sanitary paper container constitutes sealing.

Let the Seller Beware

The new food and drug bill, introduced in the last session of Congress, would, if enacted, make illegal certain harmful and deceptive practices of food and drug manufacture and distribution, and would enable the Department of Agriculture to control them. Such is the opinion of W. G. Campbell, Chief, Federal Food and Drug Administration.

Thus, the bill would make illegal deceptions in regard to quantity and quality; increase the penalties for adulteration and misbranding; penalize manufacturers for false labeling and, also, false advertising; and would allow the Secretary of Agriculture to distribute such information on any food as would protect the public health and the consumer against fraud.

Mechanical Food Expert

A 10-ft. robot in the Hall of Science at A Century of Progress lectures with gestures on the passage of food through the human body. His talk is illustrated by moving pictures playing from behind him on his transparent shirt front.

Test Pasteurizing Methods

Bottles of milk pasteurized by the short-time, high-temperature method and the long-time, low-temperature method seem to be of about the same sanitary quality, judging from the results of tests made in a commercial milk plant by the New York State Agricultural Experiment Station in connection with the New York State Department of Health. With the high-temperature method, milk is heated to a minimum of 160 deg. F. for 15 seconds; with the low-temperature method, it is heated to 143 deg. F. for 30 minutes.

While the short-time method registered slightly lower bacterial counts than the new method, the differences were not enough to justify a decision that the old method gave a better product than the new.

Theory on Peas Proved False

Research on the changes in shelled green peas, conducted at the New York State Agricultural Experiment Station, Geneva, N. Y., proves the fallacy of the belief that sugars are changed to starch when peas are held at the canning factory before processing. The basis of the proof was the discovery that, while the sugars disappeared, there was no increase in the percentage of starch.

Since delays in the regular progress of peas to the can usually cause inferior quality of the canned product, states Dr. Z. I. Kertesz in Bulletin 622 of the Experiment Station, the canner should process all raw material at once or use means to prevent or delay the chemical changes which will lower the quality of the canned product. One means is blanching, cooling and storing peas at a temperature near the freezing point.

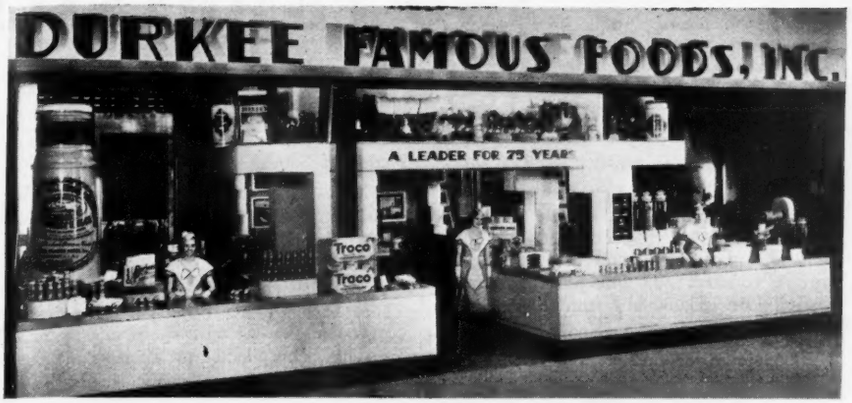
American Products Taboo

"England is definitely off free trade as a national policy. Advantages of tariff protection are now being felt, with many domestic products recognized as better than those formerly imported. Radical changes are noticeable, particularly in prepared foodstuffs . . ." writes Arthur Allen, European representative of McGraw-Hill Publishing Co., Inc., concerning the English tariff policies. "Many American factories have been or are being established, but American firms realize that goods that are typically American in appeal have little chance—that British preferences must be considered.

"A typical ad I noticed coming down to London reads: 'Heinz Pickles. British, Therefore Best.' Anti-American sentiment is at its peak . . . There is virtually no market for what is of American origin . . . To buy anything American now is to invite reproof for being unpatriotic."

CONSTRUCTION NEWS

	Proposed Construction Pending	Contracts Awarded — Awarded June	Cumulative 1933 — No. Awards	Cumulative 1933 — Total
Bakery Products	$56,000	$186,000	15	$314,000
Beverage	5,400,000	1,595,000	30	2,582,000
Canning and Preserving	156,000	.....	5	143,000
Confectionery	.....	.....	..	.....
Grain Mill Products	63,000	155,000	10	639,000
Ice Manufactured	84,000	.....	5	256,000
Meats and Meat Products	156,000	258,000	6	366,000
Milk Products	568,000	186,000	21	695,000
Sugar	.....	.....	..	.....
Miscellaneous	28,000	.....	7	328,000
Total	$6,511,000	2,380,000	99	$5,323,000



Eighty Years of Progress

Moving historical figures against a painted background in the Agricultural Building at the World's Fair indicate the long life of Durkee Famous Foods, Inc. Sample foods and large reproductions are also parts of the display.

Texas Needs Food Plants

In the majority of cities in west Texas a need for food manufacturing or processing plants is shown in a survey completed by the Chamber of Commerce. Local capital and, in a few instances, properly located sites are available to properly qualified enterprisers. Occasionally, facilities to carry on production already exist.

The needs in the food field are as follows: abattoir, Midland; bakery, Abernathy and Stratford; candy factory, Clyde, Coleman, Mineral Wells; canning plants for fruits and vegetables, Coleman, Decatur, Del Rio, El Paso, Fort Davis, Iowa Park, Levelland, Muleshoe, Presidio, Vernon and Weatherford; bean drying plant, Stephenville; creamery, Anton, Brownfield, Canyon, Coleman, Levelland, Littlefield, Mineral Wells, Muleshoe, Paducah, Presidio, San Angelo, Stephenville, Weatherford; cheese factory, Anton, Coleman, Decatur, Higgins, Levelland, San Angelo and Salton.

Cotton oil mills, Brownfield, Canadian, Hamilton, Levelland, Littefield, Paducah; egg breaking, drying and powdering plants, Anton, Graham, Hamilton, Mason, Mineral Wells, San Angelo; flour and feed mills, Dalhart, Dimmitt, Dumas, Miami; ice cream plant, Graham; meat packing plants, Pecos, Lamesa and Midland; peanut plant, Muleshoe and Rising Star.

Pecan grading, cracking and shelling plant, Decatur, Mason, Mineral Wells and Weatherford; poultry dressing plants, Decatur, Hamilton, Mason, Rising Star, San Angelo, Spur; soda water bottling plant, Mineral Wells; sweet potato curing plant, Decatur, Rising Star, Stephenville; syrup mills, Muleshoe and Spur. The survey lists also the need for a cheese factory and peanut plant in Portales, N. M., and a meat packing plant in Clovis, N. M.

Information may be had from the secretary of the Chamber of Commerce of the town in which the opportunity for a new business lies.

Concentrates

Constitutionality of the New York State Frozen Desserts Law prohibiting the sale of "bootleg" ice cream has been upheld in the Sixth District Municipal Caurt. . . . The Department of Agriculture market news service, which was to have been dropped June 19, will be continued. . . . The Farm Act will be applied to fresh fruits and vegetables.

The strike of Columbia River fishermen was settled June 4, with the fishermen being granted their demand for 8 cents a pound on raw stock, up to Aug. 1. . . . The ice cream industry has been placed under the supervision of the Farm Act, along with the other dairy processing industries.

California fruit men believe the new Food and Drug Administration regulations on dried-fruit moisture content will slow up the business and jeopardize thousands of tons of fruit. . . . Formation of a huge coffee cooperative is contemplated in Mexico to push Mexican coffee in the United States.

A tax of 10 cents a pound on oleomargarine made with coconut oil has been declared unconstitutional by the Attorney General of Illinois, being held discriminatory. . . . Beer sold in bottles in New York State must now be labeled both as to maximum and minimum alcoholic content.

The Wisconsin Senate has passed a bill authorizing any city in the state to go into the milk business. . . . Beginning July 1, all ice cream plants in Pennsylvania must obtain a license, fee being based on a gallon capacity.

Live lobsters should be kept at temperatures varying between 33 and 50 deg. F. during shipment, according to the findings in a survey by the Biological Board of Canada. . . . Lettuce of the iceberg variety, frozen and packed in crates, has been successfully shipped to the British market.

Factory Consumption of Primary Animal and Vegetable Fats and Oils, by Classes of Products, 1932†

(Quantities in thousands of pounds)

Kind of Oil	Total	Compounds and Vegetable Shortenings	Oleomargarine	Other Edible Products	Soap	Paint and Varnish	Linoleum and Oilcloth	Printing Inks	Miscellaneous Products	Loss Including Foots
Total	3,355,555	968,577	166,698	190,065	1,375,416	254,251	57,515	10,431	159,818	172,784
Cottonseed Oil	1,083,959	834,367	15,096	100,129	3,583	37	.....	8	1,786	128,953
Peanut oil	8,608	3,502	2,512	1,180	290	3	.....	.....	40	1,081
Coconut oil	549,515	8,332	123,219	40,853	353,527	13	.....	2	1,040	22,529
Corn oil	42,414	3,067	54	27,330	2,532	136	21	.....	2,152	7,122
Soybean oil	25,269	4,889	3	180	5,571	7,485	4,061	47	1,875	1,158
Olive oil, edible	1,711	.....	.....	1,516	52	.....	.....	.....	143	.....
Olive oil, inedible	6,383	.....	.....	.....	1,912	.....	.....	.....	4,471	.....
Sulphur oil or olive foots	31,474	.....	.....	.....	30,877	2	.....	.....	595	.....
Palm kernel oil	16,615	.....	.....	11,310	3,565	.....	.....	28	.....	1,712
Rapeseed oil	6,448	.....	.....	.....	89	25	14	2	6,318	.....
Linseed oil	219,746	.....	.....	.....	985	173,816	32,375	9,078	3,492	.....
China wood oil	67,948	.....	.....	.....	.....	59,158	7,299	713	778	.....
Vegetable tallow	511	.....	.....	.....	511	.....	.....	.....	.....	.....
Castor oil	14,737	.....	.....	.....	2,408	1,461	106	41	10,721	.....
Palm oil	208,547	22,126	262	415	168,009	.....	.....	1	*9,324	8,410
Sesame oil	10,514	7,797	.....	132	1,871	.....	.....	.....	25	689
Perilla Oil	5,808	.....	.....	.....	.....	3,226	1,651	143	788	.....
Other vegetable oils	9,205	957	.....	172	6,059	1,205	.....	.....	694	118
Lard	19,340	5,636	9,413	3,951	.....	.....	.....	.....	204	136
Edible animal stearin	24,251	17,357	3,684	2,243	374	.....	.....	.....	580	13
Oleo oil	15,765	1,134	12,455	80	260	24	.....	4	1,808	.....
Tallow, edible	48,555	45,708	.....	574	1,969	.....	.....	1	224	79
Tallow, inedible	585,896	.....	.....	.....	549,186	23	.....	4	36,683	.....
Grease	202,860	.....	.....	.....	143,724	23	.....	294	58,819	.....
Neat's-foot oil	3,817	.....	.....	.....	27	11	.....	.....	3,779	.....
Marine animal oils	51,974	2,185	.....	.....	48,944	38	.....	2	756	49
Fish oils	93,685	11,520	.....	.....	49,091	7,565	11,988	63	12,723	735

*Includes 7,986 thousand reported by the tin and terne plate industry.

†These statistics were compiled from the quarterly reports of the several concerns to the Bureau of the Census, supplemented by special statements covering the entire year for those manufacturing more than one class of products. For those vegetable oils for which the crude and refined products are indicated in the questionnaire—namely, cottonseed, coconut, corn, peanut, palm-kernel and soybean oils—the net consumption was arrived at by deducting from the total of both crude and refined consumed the quantity of refined produced. Oils subjected to the process of hydrogenation or other treatment for special uses were reported as consumed in the products for which intended. Data for oleo stock were not collected; hence, the secondary products, edible animal stearin and oleo oil, are shown.

MEN . . . JOBS . . . AND COMPANIES

Industry

BOOTH FISHERIES CO.'s reorganization plan has been declared operative and will be submitted to federal court for approval. The plan contemplates a new corporation.

BORDEN CO.'s subsidiary, Pioneer Ice Cream Brands, Inc., has introduced "Mel-Orol," individual-service ice cream, in the Greater New York area.

COCA-COLA CO. lost its suit charging Happiness Candy Stores, Inc., and Loft, Inc., with unfair competition and the substitution and sale as Coca-Cola of beverages not made by Coca-Cola Co.

CRESCENT BREWING CO., Joplin, Mo., contemplates the construction of a $500,000 brewery.

FALSTAFF BREWING CORP., St. Louis, will expend about a million dollars to bring the production capacity of the plant from 200,000 bbl. a year to some 700,000 bbl.

FREDONIA PRODUCTS CO., INC., Fredonia, N. Y., has experienced an unexpectedly large demand for commercial quantities of 3.2 wine.

FURNAS ICE CREAM CO., INC., Indianapolis, Ind., has remodeled and enlarged its plant until it is now one of the most modern in the Middle West. Clarence J. Hill is manager.

GENERAL MILLS, INC., won the decision in its litigation with Commander-Larabee over alleged infringement of the trademark, "Bisquick." The U. S. District Court at St. Louis held that the term "Bisquick" is a valid common law trademark.

HARTFORD BREWERY CO., Hartford, Conn., will spend $750,000 for new buildings. H. L. Pierce is president.

HORLUCK BREWING CO., Seattle, will erect a three-story building to provide additional storage space for aging and fermenting tanks. This will give the company the largest brewing establishment in the Pacific Northwest, it is reported.

GEORGE A. HORMEL & CO., Austin, Minn., will establish a branch plant at Seattle, Wash., from which Hormel products will be distributed throughout the Northwest and Alaska. Some of the produce will be exported.

HYDE PARK BREWERIES ASSOCIATION, St. Louis, has filed articles of incorporation, with authorized capital of $2,000,000. This company has almost completed negotiations for purchase of the old Hyde Park, Wainwright and Lafayette breweries from the St. Louis Brewing Association. The company will produce about 500,000 bbl. annually.

LIBBY, MCNEILL & LIBBY OF CANADA are canning asparagus at their plant at Chatham, Ontario, to evade a dumping duty on imported canned asparagus.

LOOSE-WILES BISCUIT CO., Long Island City, N. Y., has developed a new Hydrox Package which contains 20 biscuits and commonly retails at 17 cents.

MARQUETTE BREWING CO., Peoria, Ill., is being formed to produce beer, and a new $800,000 plant, modern in every respect, will be constructed. The plant will have a capacity of 125,000 bbl. annually.

NATIONAL SUGAR REFINERY, Yonkers, N. Y., which has been experimenting with the conversion of Cuban molasses into raw sugar, has added 70 employees, indicating success in the operation.

RATH PACKING CO., Waterloo, Iowa, has awarded contracts for a one-story addition to its beef cooling building and it is also constructing a five-story lard refinery; total estimated cost, $90,000.

REID MURDOCH & CO. has awarded a contract for a packing plant in West Chicago that is to cost $200,000.

SCHLITZ BREWING CO., Milwaukee, is making a drive for a greater proportion of the chain store business in beer. The first carload of Schlitz draught beer to arrive in New York since prohibition was delivered, in steel barrels, on June 16.

SCHMIDT BREWING CO., Los Angeles, has placed orders for 10,080,000 bottles and for 60,000 gross of bottle caps, and the technical director of the company, Peter G. Schmidt, recently went east to purchase equipment for two 100,000-bbl. plants.

SCHREIBER BREWING CO., Buffalo, N. Y., which for the past 13 years has been roasting and distributing coffee under the trade name "Manru," is now producing beer.

SEABROOK FARMS, Bridgeton, N. J., has leased the local plant of Snider Packing Co. for operations in 1933, Belford L. Seabrook being placed in charge. The plant will pack asparagus, peas, beans and fruit. A large portion of the frozen foods are for the account of Frosted Foods Sales Co.

SEGO MILK PRODUCTS CO., Salt Lake City, plans to remodel three plants at a cost of $500,000.

SPRECKELS SUGAR CORP., Yonkers, N. Y., will be sold at public auction July 24 unless an application by the equity receivers is denied.

STAR BREWERY, Belleville, Ill., has been sold to a syndicate of Belleville and Chicago men who will spend about $250,000 for new equipment; production, 300,000 bbl. a year.

STOKELY BROS. & CO., Louisville, Ky., have purchased the assets, good will, inventory and operating rights held by Van Camp Products Co., Indianapolis, Ind. The sale does not dispose of the plant of the packing company, which is in receivership, or of other extensive Van Camp holdings, such as the Van Camp Oil Co., of Louisville, and the Van Camp Milk Co.

G. S. SUPPIGER CO., Belleville, Ill., announces the purchase of Brooks Tomato Products Co. and Brooks Food Kitchens, Inc., Collinsville, Ill., assuming growers' contracts.

B. F. TOMPKINS ICE CREAM CO. will remodel its Columbus plant and will install more than $100,000 worth of modern freezing equipment and machinery for making ice cream and cones.

JOHN F. TROMMER, INC., Brooklyn, will build a $400,000 brewery at Orange, N. J.

UNITED MILLS, CO., INC., which has a 1,500-bbl. mill at Grafton, Ohio, has purchased a mill of equal capacity at Kansas City. United Mills is a subsidiary of Loose-Wiles Biscuit Co. The Moore-Lowry organization, from which the mill was purchased, will transfer operations from Kansas City to Topeka.

J. S. WITHINGTON & CO., Savannah syrup manufacturers, have moved plant and headquarters from Miami to Savannah, and on June 15 placed a new product, "Georgia Boy Syrup," on the local market.

PERSONNEL

B. A. AYRES, formerly identified with the food field at Fort Worth, Kansas City and Philadelphia, has returned to Fort Worth as manager of Mistletoe Creameries.

HARRY E. BARNETT and WILLIAM R. MCKELDIN have purchased Atmore & Son, Inc., Philadelphia manufacturers of mincemeat, puddings and mayonnaise. Mr. Barnett, who became connected with Atmore in 1902, is secretary-treasurer of the new organization. Mr. McKeldin, who started with the company in 1907, will be president.

ELMER E. CHASE has been elected president of Canners' League of California; Preston McKinney, a vice-president and secretary.

ROWLAND J. CLARK, formerly director of Schulze Baking Co. laboratory in Kansas City, will head the cake research laboratory established by American Dry Milk Institute to investigate the use of fat-free milk solids in bakers' cakes.

GORDON C. CORBALEY
Becomes Adviser to Administration

EDWARD PRITCHARD
Pioneer Canner Succumbs at 76

GORDON C. CORBALEY, president of American Institute of Food Distribution, New York, will act as unofficial adviser to the administration in developing possibilities of readjustments and agreements in the food trade field under the Agricultural Adjustment Act.

J. P. DICKINSON, former board chairman of Tri-State Cotton Seed Oil Mill Superintendents, was elected president of the association June 10. He succeeds G. E. Ryan, of Valley Oil Mills.

GEORGE R. FLACH, New York, is the new president of National Federated Flour Clubs; GARTLAND HORAN, Philadelphia, first vice-president; JOHN MCGRAW, Nashville, second vice-president; S. O. WERNER, Chicago, secretary; W. G. MARTIN, JR., New York, treasurer.

JAMES A. FOLGER was recently named chairman of the industrial control committee of Pacific Coast Coffee Association.

W. W. FRAZIER, JR., vice-president and sales manager of Franklin Sugar Refining Co., Philadelphia, resigned June 15. WALTER E. BEARD, sales promotion manager for the past five years, succeeded him. WILLIAM F. JETTER became sales manager.

WILLIAM A. HEFLER, Boston, has been reelected president of New England Bakers' Association. HORACE D. LIKENS is executive secretary.

WILLIAM F. HEIDE, president of Henry Heide, Inc., New York, was named zone chairman of the Greater New York-New York State-New Jersey confectionery trade in connection with activities under the Industrial Recovery Act.

HOWARD HEINZ, president of H. J. Heinz Co., Pittsburgh, is chairman of National Industrial Conference Board.

GEORGE E. KING, recently resigned as vice-president, assistant secretary and assistant treasurer of Red Star Milling Co., Wichita, Kan.

P. G. KINZER, Carnation Co., is now chairman of the Evaporated Milk Association. He succeeds LOWELL WILSON, Indiana Condensed Milk Co., who was recently elected president of Golden State Milk Products, San Francisco.

W. D. LIPPITT, president of Great Western Sugar Co., Denver, has been reelected president of United States Beet Sugar Association. NEIL KELLY, Washington, D. C., is secretary-treasurer.

O. E. MERTZ, an expert on butter, is now operating a small creamery at Edon, Ohio. Mr. Mertz was superintendent of Schlosser Bros., Fort Wayne, Ind., for 23 years.

ROBERT F. MILLER, former executive vice-president of Associated Grocery Manufacturers of America, has joined a group of specialists recently organized at Washington by Nelson B. Gaskill to serve consumer goods industries as advisers on operation under the recent legislation.

LORENZ NEUHOFF, JR., has purchased Scott Packing Co., Lynchburg, Va., changing the name to Neuhoff, Inc., of which he will be president. LORENZ NEUHOFF, SR., former executive of Neuhoff Packing Co., Nashville, and of White Provision Co., Atlanta, will be vice-president; J. B. HARRIS, principal owner of the Scott company, will be secretary.

ADOLPH PFEFFER, Houston, Texas, has been elected president of Rice Millers Association. He succeeds F. J. Jumonville, Baton Rouge.

HENRY SCHNEIDER, Dayton Biscuit Co., was recently elected president of Independent Biscuit Manufacturers' Association. H. D. BUTLER, New York, was elected secretary.

J. M. SCHNEIDER has been promoted from factory superintendent of Cushman's candy department to candy consultant and merchandiser for all of the company's branches. EDWARD MILLER, assistant to Mr. Schneider, is the new factory superintendent.

FRED H. SEXAUER, Auburn, N. Y., was reelected president of Dairymen's League Cooperative Association on June 16. All other league officers were reelected.

OSCAR STOUT has been appointed plant superintendent of Sweets Co. of America, New York, to succeed Homan J. Maloney, resigned. Mr. Stout was formerly factory superintendent of Edgar P. Lewis, Boston candy concern, and he had been in charge of production for Park & Tilford, New York.

HAROLD HIGGINS SWIFT, Swift & Co. vice-president, was awarded honorary degree of Doctor of Laws by Brown University.

GEORGE C. THIERBACH, Jones-Thierbach Co., San Francisco, has been chosen to succeed Benjamin J. Older, San Francisco, retiring president of Pacific Coast Coffee Association.

BENJAMIN TITMAN, formerly president of Van Camp Products Co., Indianapolis, heads the newly formed Titman Food Products Co.

W. J. TOWLE, JR., is now vice-president of Pioneer Maple Products Co. and P. J. TOWLE is treasurer. The Towle brothers, who were prevented from engaging in the syrup business for five years after selling their Log Cabin business to General Foods in 1927, are now manufacturing Bucket Syrup.

H. C. VANDERVOORT, former manager of Fort Worth plant of Southwest Dairy Products Co. and at one time in the creamery business in San Angelo, Texas, heads a new creamery at Fort Worth.

FRANCIS R. WILCOX, general manager of United Prune Growers of California, resigned July 1 to return to the University of California.

ISAAC E. WOODARD succeeds Edgar H. Evans, for 24 years president of Acme-Evans Co., flour miller of Indianapolis. Mr. Evans continues as chairman of the board.

DEATHS

WILBUR ERSKINE, 70, president of Akin-Erskine Milling Corp., Evansville, Ind., died recently at his desk, of apoplexy.

FREDERICK POOLE GORHAM, head of the department of biology at Brown University and an expert on milk pollution, died June 4 after a heart attack. He was 62.

BERNARD H. KROGER, JR., a director and former treasurer of Kroger Grocery & Baking Co., Cincinnati, died June 5 from internal injuries suffered in an automobile accident. He was 45.

EDWARD PRITCHARD, 76-year-old pioneer of the canning industry, died June 21. Mr. Pritchard set himself up in New York City as a manufacturer of condiments with only a barrel of ketchup and some bottles. His progress was rapid and continuous. Besides two incorporated plants at Bridgeton, N. J., and Saratoga, Ind., he was proprietor of plants at Franklin, Ind.; Winslow Junction and Hammonton, N. J.; and New York. Mr. Pritchard also had a large interest in a 1,500-acre New Jersey farm.

WALTER C. SCHMIDT, vice-president of Van Vechten Milling Co., Rochester, N. Y., since its organization in 1913, died May 29 at the age of 54.

FRANKLIN D. SHOVE, for 18 years treasurer of the Borden Co., died June 14 at Mt. Vernon, N. Y. Mr. Shove, who was 73, had been connected with the Borden Co. 34 years, retiring in 1921.

WINCHELL SMITH, internationally famous playwright who for many years operated a flour mill at Farmington, Conn., died June 10.

R. L. WHALEY, 42-year old general manager of the Southwest Dairy Products Co., San Antonio, Texas, and general manager of the entire system, died of heart failure June 14.

Associated Industries

CHERRY-BURRELL CORP., Chicago, has acquired the assets of Stout Manufacturing Co. pertaining to the manufacture of Stout Multisoak washers.

E. F. HOUGHTON & CO., Philadelphia, have appointed GEORGE S. ROGERS general sales manager with headquarters at Philadelphia.

INTERNATIONAL HARVESTER CO., Chicago, has a display at the World's Fair which occupies the entire north wing of the Agricultural Building.

LINK-BELT CO., Chicago, has an extensive exhibit of chain drives at A Century of Progress.

SYRACUSE CONTAINER CORP. has been formed to take over Delavan Corrugated Box, Inc., Syracuse, N. Y., and the Seneca Fibre Products Co., Skaneateles, N. Y. The newly formed company is affiliated with Robert Gair Co., Inc.

VIKING PUMP CO., Cedar Falls, Iowa, has established a permanent exhibit in connection with its Chicago office, 549 West Washington Blvd.

BUSINESS TRENDS

Salad Dressing Up 52.5%

Production of salad dressing increased 52.5 per cent in 1932. As a result, the output of mayonnaise and related products registered an 8.3-per cent jump, although all of these products other than salad dressing dropped considerably. These figures were obtained in the fifth annual survey of the mayonnaise industry by the Department of Commerce, replies being received from 85 manufacturers.

Other trends are indicated by the survey. The percentage of mayonnaise and related products distributed through wagons decreased from 71.2 in 1931 to 58.8 last year. The percentage packed under manufacturers' labels decreased from 93.9 in 1931 to 90.1 in 1932. And for the second time in two years the percentage of total production put up in the quart size doubled as compared with the previous year, the figure being 25.2 per cent for this year. Less than 2 per cent of the total was packed in sizes other than the five standard ones.

The following table shows the trend in production:

Product	1932, Gallons	1931, Gallons	Per Cent Change
Mayonnaise.....	10,121,015	11,161,745	— 9.3
Salad dressing....	8,798,702	5,769,709	+52.5
Sandwich spread.	2,325,103	2,432,757	— 4.4
Thousand Island, French, and others.....	1,111,460	1,284,038	—13.5
Total.....	22,356,280	20,648,249	+ 8.3

BASIS FOR THE CURVES

Retail food prices, factory employment, factory payrolls and wholesale prices are based on indexes of the Department of Labor. Cost-of-living index is that of the National Industrial Conference Board. Electrical power consumption figures are furnished by *Electrical World*.

Food Prices Lag

Unseasonably hot weather during much of June is largely responsible for the failure of food prices to follow the upward trend of general prices. Furthermore, the anticipated upset in customary business methods expected to result from N.I.R.A. and A.A.A., both of which will affect the food industries, is a force difficult to evaluate but probably none the less real in holding down food prices. Especially important is this in the case of foods where a processing tax is to be imposed.

Average wholesale prices of all commodities reported by U. S. Department of Labor rose 3.5 per cent during the 5-week period ending June 17. But food prices rose only 1.52 per cent, whereas farm products rose 7.7 per cent, indicating that sooner or later food prices must rise correspondingly.

In contrast, the N. Y. *Journal of Commerce* weighted index of prices for four weeks ending June 24 shows larger increases: General index at 63.7, up 5.5 per cent; grains at 61.8, up 15.7 per cent; foods at 53.6, up 2.9 per cent.

The Business Week Index has risen continuously since March and stands at 64.1 for the third week in June, equalling the highest figure for last year.

A. & P. tonnage sales for period ending May 27 decreased 9.2 per cent from corresponding 1932 figures. Dollar sales in this period fell off 15.07 per cent.

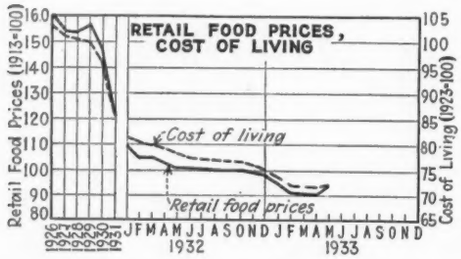
Domestic Crops Suffer

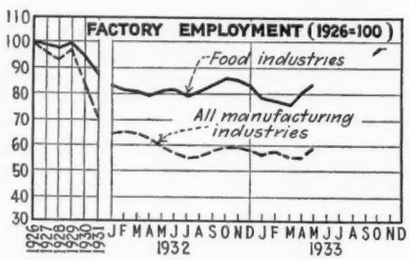
Severe weather, grasshoppers and plant diseases promise to do much this year toward ridding the country of its disastrous surpluses of foodstuffs. Reports from the Northwest indicate that the heat has caused considerable damage to crops in Nebraska, the Dakotas and Minnesota, with grasshoppers causing severe losses in North Dakota and South Dakota. Both grain crops and livestock have been hard hit by drought in Kansas, Indiana and Ohio. Pastures have been burned up in sections of these states.

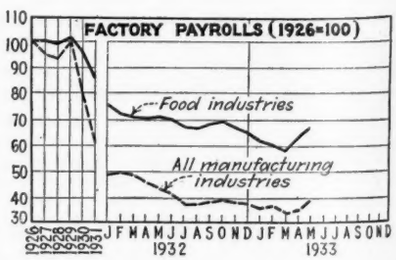
In Michigan, a serious outbreak of leaf blight threatens the celery crop, while the fruit harvest in the Pacific Northwest is expected to be seriously curtailed as a result of the cold, wet weather experienced during the spring. In the Southwest, rice acreage is estimated at 15 per cent below last year, and the price of brewers' rice has risen from $0.65 to $1.65 per 100 lb., sharp advances being made in other grades also.

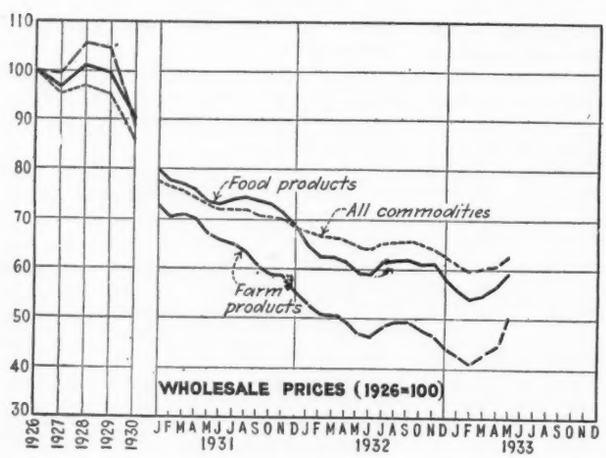
Peas for canning may be an exception to the general decrease in crops this year. The planted acreage amounts to 104.4 per cent of that last year, and even though losses may be high, it must be recalled that the drought and pea aphid contributed to exceptionally high damage in 1932 and 1931. June 25 rains in Wisconsin and Minnesota may increase quantity and quality.

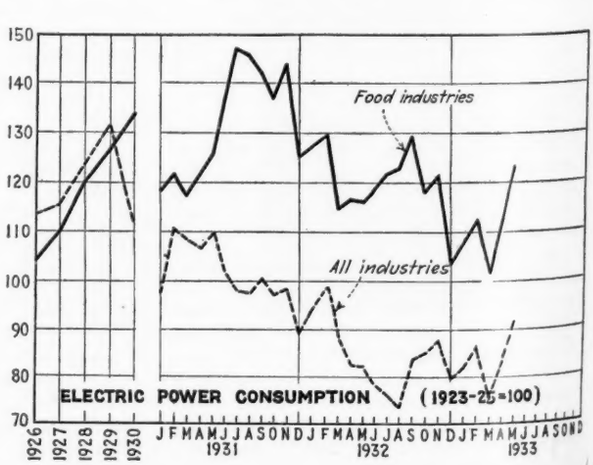
The sugar beet crop this year will be large, an estimate by Dr. A. J. Brock, Farmers and Manufacturers Beet Sugar Association, placing domestic production of beet sugar at 1,400,000 short tons.


RETAIL FOOD PRICES, COST OF LIVING
Retail Food Prices (1913=100)
Cost of Living (1923-100)
Cost of living
Retail food prices
1926 1927 1928 1929 1930 1931
J F M A M J J A S O N D J F M A M J J A S O N D
1932
1933


FACTORY EMPLOYMENT (1926=100)
Food industries
All manufacturing industries
1926 1927 1928 1929 1930 1931
J F M A M J J A S O N D J F M A M J J A S O N D
1932
1933


FACTORY PAYROLLS (1926=100)
Food industries
All manufacturing industries
1926 1927 1928 1929 1930 1931
J F M A M J J A S O N D J F M A M J J A S O N D
1932
1933


Food products
All commodities
Farm products
WHOLESALE PRICES (1926=100)
1926 1927 1928 1929 1930
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1931
1932
1933


Food industries
All industries
ELECTRIC POWER CONSUMPTION (1923-25=100)
1926 1927 1928 1929 1930
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1931
1932
1933

In the world picture, coffee is one surplus crop that will not be reduced. Estimated world production totals almost 40,000,000 bags, compared to a probable consumption of not more than 23,000,000 bags.

Less Canned Fish Eaten

Per capita consumption of canned fish has declined, in general, in the last few years. Estimates of the per capita consumption of canned fish, preserved fish other than canned, and of shellfish simply cooked, as compiled by the Bureau of Foreign and Domestic Commerce, are as follows:

	1928, lb.	1929, lb.	1930, lb.	1931, lb.	1932 lb.*
Salmon	2.37	2.18	2.01	2.12	2.29
Sardines	1.11	1.17	.87	.71	.70
Tuna	.24	.30	.39	.24	.28
Shrimp	.12	.12	.11	.11	.10
Oysters	.06	.06	.05	.04	.06
Clam products	.11	.11	.11	.10	.08
Crab	.11	.09	.10	.08	.06
Mackerel	.16	.24	.02	.03	.03
Alewives and alewife roe	.04	.04	.05	.03	.01
Miscellaneous canned fish	.11	.11	.11	.09	.09

Salmon Pack to Be Large

In the doldrums for four years, the salmon packing industry is staging a comeback this season, with an estimated Puget Sound pack of 1,100,000 cases and an Alaska take of 6,000,000 cases. Not since 1929 have the annual outputs neared these estimates. The major reason is that 1933 is the year for the quadrennial return of the sockeye to Washington waters en route to their Fraser River spawning grounds and the year for the biennial run of pink salmon.

Wheat Picture Brightens

The world wheat situation brightened up considerably on June 23, when it was announced that the four largest wheat producing countries, the United States, Agentina, Canada and Australia had reached an agreement at the London conference to restrict acreage for two years. Early unofficial reports placed the amount of reduction at 15 per cent. France, however, dealt a blow to world wheat regulation June 24, when the Chamber of Deputies approved a bill granting a bonus of $1 a bushel to French wheat exporters and barring all imports.

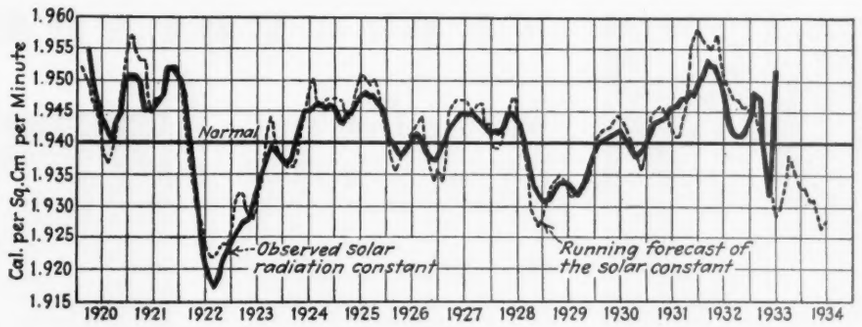
The wheat acreage for 28 reporting countries stands at 187,130,000 acres, as against 197,493,000 last year. While the domestic crop is low, Secretary Wallace has pointed out that a 350,000,000-bu. carryover as of July 1 and the chance for a good crop next year makes acreage reduction imperative.

Sales of Silos Decline

Silo sales in Michigan and Minnesota by large manufacturers show a trend that will have a bearing on cost of milk production, particularly if it becomes necessary to salvage the corn crop in the fall on account of early frosts.

Index of Silo Sales.
1928 = 100 Per Cent

	1928	1929	1930	1931	1932	1933 (Est)
Michigan	100	118	107	38	21	very few
Minnesota	100	100	93	30	46	10



Solar Radiation Jumps Unexpectedly

Contrary to expectations and careful forecasting, the solar radiation constant went to an average value of 1.952 calories per square centimeter per minute during the month of May. Reports for the first ten days in June are almost equally high. The May increase was a jump of almost one per cent from ½ per cent below normal to ½ per cent above normal. It seems more than likely that the recent hot, dry weather has been caused by this unexpected increase in solar heat.

These values are derived from observations of the Smithsonian Institution at Table Mountain, Ariz., alone. A change of observers was made there in May. Possibly a change in scale has occurred thereby. Until about a year has elapsed when the Montezuma (Chile) values become available these unexpected figures are to be regarded as tentative. FOOD INDUSTRIES will continue to report them, however, as long as they are available.

Recent monthly mean figures have been reported as follows:

Dec., 1932	1.945	March, 1933	1.940
Jan., 1933	1.948	April, 1933	1.932
Feb., 1933	1.947	May, 1933	1.952

INDICATORS

WAGES have been increased 5 per cent by Phoenix Holsum Bakery, Phoenix, Ariz.; 10 per cent by master bakers of East Liverpool, Ohio, whose business has increased 13 per cent since May 1; and 5 per cent by City Packing Co., Fort Worth, Texas.

THE SOUTHWEST'S first cheese plant, at Carlisle, Ark., was six years old June 15; it has expanded from an initial capacity of 25,000 lb. of milk daily to 100,000 lb.

RECEIPTS OF HOGS during first part of June were up 11 per cent over first half of May and 36 per cent over first 15 days of April. Movement of cattle is still large; sheep receipts have been decreasing.

SCALLOP BEDS of Massachusetts have been rid of starfish and this season's crop is expected to be best in years.

BUTTER MAKERS fear higher prices will reduce milk consumption, with the result that more milk will have to be made into butter.

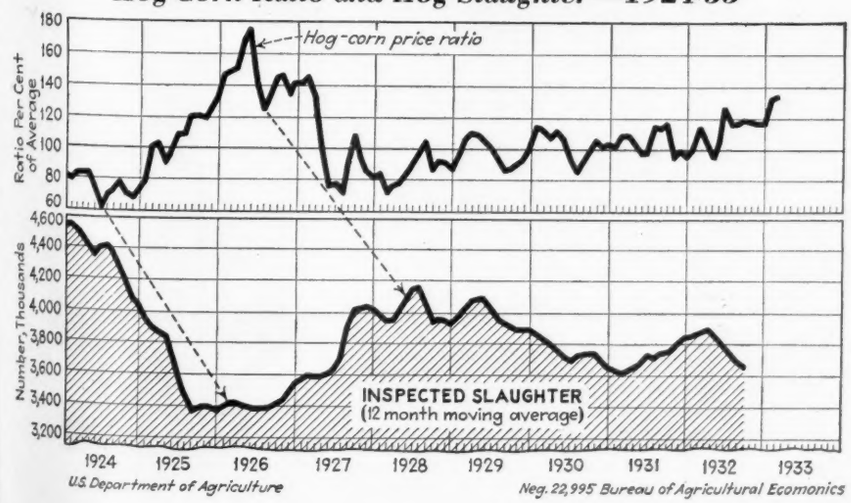
CANDY CONSUMPTION was 1.3 per cent higher last year, while dollar value of sales declined 19.6 per cent.

AFTER TWO YEARS of complete idleness, the Franklin (Ind.) plant of E. Pritchard will be reopened to pack tomato products. F. H. Swift Co. will reopen a pickle plant at Sidney, Ind., which has been closed three years.

BEER PRODUCTION by the fourteen members of New York State Brewers' Association increased 13,000 bbl. in the second 30-day period of legalization . . . At the April-May rate, brewers will pay the government $280,000,000 in revenue annually.

ANOTHER CHEESE FACTORY is scheduled for the central states. Kraft-Phenix plans a branch factory at Franklin, Ind.

Hog-Corn Ratio and Hog Slaughter—1924-33



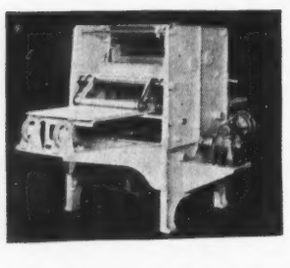
NEW • EQUIPMENT • FOR

Steel Beer Barrels

Constant capacity, uniform weight and seamless construction are the advantages claimed for the "Hackney" pressed-steel beer barrel by the Pressed Steel Tank Co., Milwaukee, Wis. The seamless interior is said to insure complete drainage, easy cleansing and sterilization. There are two kinds available: the straight-sided type and the bilged type. The former is equipped with extra combination rolled hoop and footring; the latter, as illustrated, is of double wall construction and is insulated.

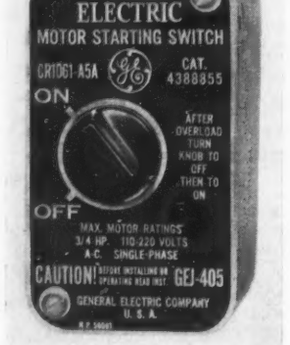
Aluminum Caps

Attractive in appearance, the aluminum C.T.B. screw cap made by Anchor Cap & Closure Corp., 22 Queens St., Long Island City, N. Y., is corrosion-resistant and will not contaminate the product. This cap is supplied in sizes from 18 to 33 mm., and may be had in gold or colored lacquer finishes or in white or colored coatings. Linings may be specified according to the type of product to be packaged. An inverted bead in the top concentrates the sealing pressure and provides a panel for decorating or identifying the bottle.



Dough Slicer

Slicing the loaf before baking is the function of the "Do-Slicer," manufactured by B. F. Perkins & Son, Inc., Holyoke, Mass. The molded dough is passed to a cutting frame, where 25 sickle-shaped knives revolve through slots in the frame. Melted butter or other lubricant on the knives prevents the slices from becoming firmly rejoined. The finished loaf remains a unit, though divided into slices which may be taken from the loaf one by one, without breaking up the remainder. The machine is 4½ ft. high, 4½ ft. wide, and seven feet deep. It has a ½-hp. motor and a speed-reduction unit.

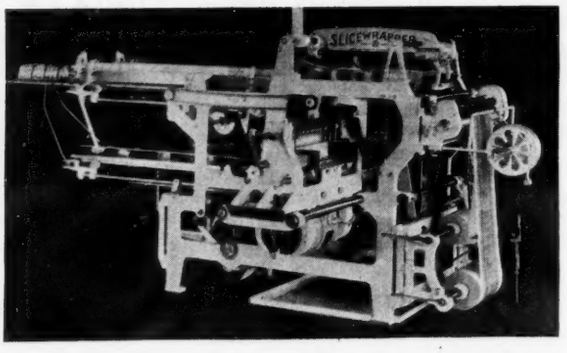


Overload Switch

Complete protection against stalled-rotor current and injurious overload conditions is provided by General Electric Co., Schenectady, N. Y., in its new hand-operated starting switch for either single-phase a.c. or d.c. fractional horsepower motors. The a.c. switch may be had in the open and inclosed types and for hazardous locations. The molded parts are of Textolite and the contact tips of silver.

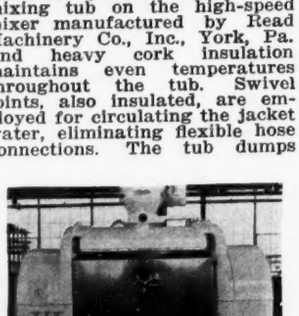
Single-Suction Pump

Demand for a less expensive self-priming pump led Buffalo Pumps, Buffalo, N. Y., to develop a single-suction pump with built-in self-primer. The self-primer is manufactured under license from Nash Engineering Co. The new pump, type "CP," is cased in cast-iron, and impellers, whether of the open or closed type, are bronze. The self-primer is mounted as a part of the pump casing. As the pump shaft is an extension of the motor shaft, the radial and thrust loads are taken by the motor bearings. Capacities range as high as 450 g.p.m.; heads up to 150 ft.



Slice-Wrapper

Only a split second elapses between the slicing and wrapping of bread with the combination machine developed by the American Machine & Foundry Co., 511 Fifth Ave., New York, N. Y. Thus, the bread is exposed to mold spore contamination for a minimum length of time. This machine may be quickly adjusted to wrap unsliced loaves. Attended by one person, the machine slices and wraps per hour as many as 1,700 loaves ranging from 7 to 17 in. long. It requires a floor space measuring 8 ft. 1 in. x 10 ft. 2 in.



High-Speed Mixer

Eighty per cent larger cooling area is said to be provided by the water-jacketed ends of the mixing tub on the high-speed mixer manufactured by Read Machinery Co., Inc., York, Pa. And heavy cork insulation maintains even temperatures throughout the tub. Swivel joints, also insulated, are employed for circulating the jacket water, eliminating flexible hose connections. The tub dumps automatically. Capacities available range from 400 to 1,000 lb. The unit illustrated accommodates a 1,000-lb. batch; it operates at three speeds: 30, 45 and 60 r.p.m. The mixer operates on the low and intermediate speeds for a fixed time and then automatically goes into high. A fully automatic push-button control is provided.

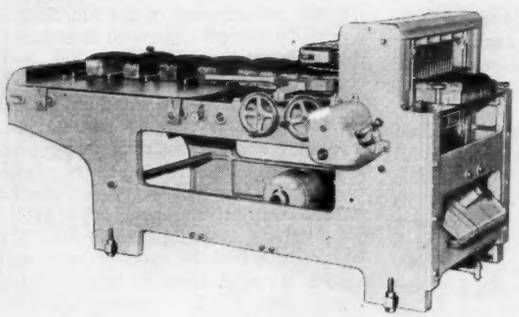
Heater-Humidifier

Shallow cups mounted one below the other on vertical steam pipes form the evaporating elements in the heater-humidifier placed on the market by B. F. Sturtevant Co., Hyde Park, Boston, Mass. Two rows of these cups are supplied with water from one petcock, each unit having three petcocks. A motorized valve regulates the flow of water to the humidifier, the valve being controlled by a hygrostat; a reducing valve regulates the pressure of the water supplied to the humidifying element. Another control prevents the operation of the fan and the humidifier until steam has completely circulated through the unit. A thermostat controls the temperature. The Sturtevant heater-humidifiers are made in three sizes that have a heating value, respectively, of 312, 409 and 506 sq.ft. of direct radiation.

Three-in-One Bottler

Three cases of half pints may be syruped, filled and crowned per minute with the fully automatic, self-contained CEM Rotary "24," developed by the Crown Cork & Seal Co., 1508 Barclay St., Baltimore, Md. The syrupers are of the 4-oz. Dixie type with capacity up to 6 oz. The fillers have 24 two-piece valves of nickel-silver and stainless steel. The straight-through conveyor chain handles 6- to 32-oz. bottles.

FOOD • MANUFACTURERS



"Automotive" Slicer

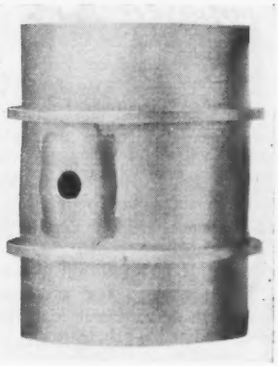
Caterpillar treads are used as conveyors in a bread slicing machine, the Littlefield Eight, announced of late by the Battle Creek Wrapping Machine Co., Battle Creek, Mich. Two treads are employed, one below and one above, in feeding the loaves to the knives, so that there is controlled compression until just before the actual slicing. The capacity of the machine is about 3,000 loaves per hour. It is similar to a two-cycle gasoline engine in that it has a balanced crankshaft and pistons moving in lubricated cylinders. Power is furnished by an electric motor.

Bagging Small Sizes

To provide a machine for packing peck and other size packages, Johnson & Bassett, Inc., Worcester, Mass., has developed the J. & B. Bagging Machine. Buckets measuring the desired quantities take the produce up the elevator to a hopper under which the cloth or paper bag is suspended, and drop it into the bag. The bag is weighed and passed to a sewing machine for closure. This operation turns out 550 pecks per hour in cloth bags and 600 pecks per hour in paper ones, and requires three operators. The entire machine is 16 ft. 2 in. long, 3 ft. 4 in. wide, 6 ft. 7 in. high.

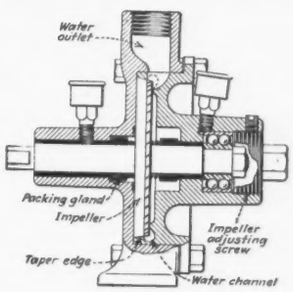
Aluminum Beer Keg

Weighing only 21 lb., the aluminum beer barrel now manufactured by Aluminum Co. of America, New Kensington, Pa., is easy to handle. Of the half-barrel size, the container measures 17 in. in diameter and 22 in. in length, holding 15½ gal. The manufacturer maintains that pitching and painting and lining are unnecessary, and that in this container beer retains its color and taste unchanged.



Adjustable Pump

A taper-edged impeller allows a variation in capacity from 5 to 200 g.p.m. at heads up to 350 ft. in the Type "T" turbine pump manufactured by Roots-Connersville-Wilbraham, Connersville, Ind. It can be effectively used in industries where the quantity of liquid to be pumped is small and the head is relatively high. Corrosion-resisting metals and alloys are available for meeting special industrial requirements.

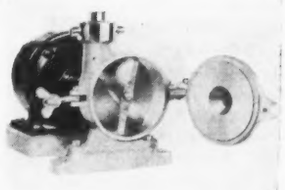


Shows Rate of Flow

Accuracy within 1½ per cent is possible in measuring rates of flow and differentials with an indicator manufactured by Morey & Jones, Ltd., 922 South Hemlock St., Los Angeles, Calif. The instrument will also show liquid levels in tanks. It is mechanically operated, being actuated by a metal bellows. It is built for a maximum pressure of 250 lb. per square inch and is made with differential pressure range of 5 in. of mercury to 25 lb.

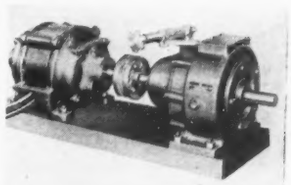
Fittings and Pumps

To enable dairies and food plants to effect a step-by-step modernization of fittings and equipment, the Tri-Clover Machine Co., Kenosha, Wis., is manufacturing stainless steel fittings which may be substituted for bronze fittings. New models of stainless steel sanitary pumps also are available. The circulating type of pump is of impeller construction, a one-piece impeller pushing the liquid gently through the pump. The recent models also include brine and water pumps.



Variable Reducers

Infinite speed variations within a given range are provided by a variable speed reducer announced by Smith Power Transmission Co., Penton Bldg., Cleveland, Ohio. It is a single-unit machine composed of five one-way, overrunning clutches which transmit power in uniform cycles to a central driven gear mounted on two ball bearings. It is controlled by a lever locked with a hand wheel. A visible dial indicates the speed of the output shaft. The reducer's output speed ranges from 0 to 240 r.p.m.



Humidigraph

Percentage relative numidity is recorded directly by a humidigraph introduced by Bristol Co., Waterbury, Conn. The instrument utilizes a hydroscopic device consisting of sensitive wood fibers built up on a nickeled wire screen and wound in the form of a spiral. Changes in relative humidity create a deformation that causes the free end to rotate about the central axis of the spiral. Simple linkages transfer this movement to a pen arm. The humidigraph is available in round faced models, using 4-in. or 8-in. charts, and it may be had in portable form or for surface mounting. A combination instrument with two pens, one recording relative humidity and the other, temperature, may be furnished.

The Manufacturers • • Offer • •

Pumps—Flexi-unit pumps of single- and double-bearing types are the subjects of Bulletin No. 203 by Gould Pumps, Inc., Seneca Falls, N. Y. Pump selection charts are provided.

Brewery Lubrication—Texas Co., 135 East 42d St., New York, N. Y., deals in a 12-page leaflet with lubrication requirements of brewery machinery. Numerous illustrations and diagrams accompany the topical discussions.

Deodorization—The description of the deodorization of oils and fats in a 3-page pamphlet by Schutte & Koerting Co., Philadelphia, Pa., has much practical value, both in the outline of the Lurgi system and in the supplementary illustrative sketch of plant arrangement.

Control Valves—Electric control valves and their application in refrigerating plants are described in a 12-page bulletin, 203-A, by Frick Co., Inc., Waynesboro, Pa. Piping and wiring diagrams are shown.

Laboratory Analysis—A paper on interpreting results of flour analysis into bakeshop practice, presented before American Society of Bakery Engineers, is available. Address, Victor E. Marx, 1541 Birchwood Ave., Chicago, Ill.

Economic Index—An 80-page booklet by Metropolitan Life Insurance Co., New York, N. Y., lists the company's reports, addresses and articles on economics in industry.

Modernization Pays—An attractively printed 12-page booklet presenting specific cases in which considerable savings have been made through modernization is offered by General Electric Co., Schenectady, N. Y.

Ice Cream Cans—Facts and figures concerning steel cans for ice cream are compiled in a 15-page booklet by Milk and Ice Cream Can Institute, Cleveland, Ohio. Special attention is given to the cost per trip of using a 20-qt. steel can with a 4-year life in large-size ice cream plants.

Leather Belts—the 24x36-in. wall chart on "The Care of Leather Belts," distributed by E. F. Houghton & Co., 240 West Somerset St., Philadelphia, Pa., comprises a handy guide to dressing, lacing, fastening and adjusting belts.

Flaking Mills—Descriptions of flaking mills for different branches of the food industry form the 15-page Bulletin 1249 by Allis-Chalmers Manufacturing Co., Milwaukee, Wis. It is generously illustrated and includes a list of the company's products.

Flavors—The periodical wholesale price list of Fritzsche Brothers Inc., 78 Beekman St., New York, N. Y., lists in its 12 pages a large number of essential oils and flavors and other chemicals.

Wire Cloth—An 8-page illustrated folder by International Nickel Co., 67 Wall St., New York, N. Y., outlines briefly how the use of screen and filter cloth solves filtration problems. One page is devoted to food processes.

Dryers—A 31-page catalog by Louisville Drying Machinery Co., Louisville, Ky., describes dryers suitable for food and other industries.

Balances—Sartorious analytical balances are fully described and illustrated in a catalog by Pfaltz & Bauer, Inc., 300 Pearl St., New York, N. Y.

Proposed New Food and Drugs Law

(*Continued from page 267*)

(f) Any person who forges, counterfeits, simulates or falsely represents, or without proper authority uses any mark, stamp, tag, label or other identification devices authorized by the provisions of Secs. 12 and 22 of this Act or regulations thereunder, shall be guilty of a misdemeanor, and shall on conviction thereof be subject to imprisonment for not more than one year, or a fine of not less than $1,000 nor more than $5,000, or both such imprisonment and fine.

LIABILITY OF CORPORATE OFFICERS

SEC. 18. (a) When construing and enforcing the provisions of this Act, the act, omission or failure of any officer, employee or agent acting for or employed by any person, within the scope of his employment or office, shall in every case be deemed to be the act, omission or failure of such person, as well as that of the officer, employee or agent.

(b) Whenever a corporation or association violates any of the provisions of this Act, such violation shall also be deemed to be a violation of the individual directors, officers or agents of such corporation or association who authorized, ordered or did any of the acts constituting, in whole or in part, such violation.

INJUNCTION PROCEEDINGS

SEC. 19. (a) The repetitious introduction into interstate commerce of any adulterated or misbranded food* or the repetitious dissemination by radio broadcast or United States mail or in interstate commerce of false advertising of any food,* by any person, is hereby declared to be a public nuisance. In order to avoid multiplicity of criminal proceedings with respect to such person or libel for condemnation proceedings with respect to the food,* the District Courts of the United States are hereby vested with jurisdiction to restrain by injunction, temporary or permanent, any person from continuing any such nuisance. In such injunction proceedings it shall not be necessary to show on the part of such person an intent to continue such nuisance.

(b) Violation of any such injunction may be summarily tried and punished by the court as a contempt. Such contempt proceedings may be instituted by order of the court or by the filing of an information by the United States Attorney; and process of the court for the arrest of the violator may be served at any place in the United States or subject to its jurisdiction.

IMPORTS

SEC. 20. (a) The Secretary of the Treasury shall deliver to the Secretary of Agriculture upon his request, from time to time, samples of food* which are being imported or offered for import into the United States, giving notice thereof to the owner or consignee, who may appear before the Secretary of Agriculture and have the right to introduce testimony. If it appears from the examination of such samples or otherwise that (1) any false advertisement of such food* has been disseminated in the United States within three months prior to the date such article is offered for import, or (2) such article has been manufactured, processed or packed under unsanitary conditions, or (3) such article is adulterated or misbranded within the meaning of this Act, then such article shall be refused admission.

(b) The Secretary of the Treasury shall refuse delivery to the consignee and shall cause the destruction of any such article refused admission, unless such article is exported by the consignee within three months from the date of notice of such refusal, under such regulations as the Secretary of the Treasury may prescribe: *Provided,* that the Secretary of the Treasury may deliver to the consignee any such article pending examination and decision in the matter on execution of a bond as liquidated damages for the amount of the full invoice value thereof together with the duty thereon, and on refusal to return such article or any part thereof for any cause to the custody of the Secretary of the Treasury when demanded for the purpose of excluding it from the country or for any other purpose, said consignee shall forfeit the full amount of the bond as liquidated damages.

(c) All charges for storage, cartage and labor on any article which is refused admission or delivery shall be paid by the owner or consignee and in default of such payment shall constitute a lien against any future importations made by such owner or consignee.

PUBLICITY

SEC. 21. The Secretary shall cause to be published periodically a report summarizing all judgments, decrees and orders which have been rendered, and all proceedings instituted and seizures made, including the nature of the charge and the disposition thereof. The Secretary shall cause to be disseminated such information regarding any food* as he deems necessary in the interests of public health and for the protection of the consumer against fraud.

VOLUNTARY INSPECTION SERVICE

SEC. 22. The Secretary, upon application of any manufacturer or packer of any food* sold in interstate commerce, may at his discretion designate supervisory inspectors to examine and inspect all premises, equipment, methods, materials, containers and labels used by such applicant in the production of food*. If upon such examination the food* is found to conform to the requirements of this Act, the applicant may be authorized, in accordance with regulations prescribed by the Secretary, to mark the food* so as to indicate such conformity and such other facts relating to the identity or quality of the food* as the regulations may provide. Services to any applicant under this section shall be rendered only upon the payment of fees to be fixed by regulations of the Secretary in such amount as to cover the cost of the supervisory inspection and examination, together with the reasonable costs of administration (including costs of establishing under Sec. 11 additional definitions and standards for the purposes of this section) incurred by the Secretary in carrying out this section. Receipts from such fees shall be covered into the Treasury and shall be available to the Secretary for expenditures incurred in carrying out this section.

SEC. 23. (a) The Secretary of Agriculture is authorized to prescribe such regulations as he may deem necessary for the efficient enforcement of the functions vested in him by the provisions of this Act (other than the provisions of Sec. 20), including regulations with the force and effect of law as to notice and conduct of hearings by the Secretary. The Secretary of the Treasury and the Secretary of Agriculture shall jointly prescribe such regulations as they may deem necessary for the efficient enforcement of the provisions of Sec. 20. Regulations prescribed under this Act shall be promulgated in such manner and take effect at such time as the Secretary of Agriculture (and, in appropriate cases, the Secretary of the Treasury) shall determine.

(b) For the efficient administration of the provisions of this Act, the provisions, including penalties, of Secs. 9 and 10 of the Federal Trade Commission Act, approved Sept. 26, 1914 (U.S.C., title 49, Secs. 49 and 50), are made applicable to the jurisdiction, powers and duties of the Secretary under this Act and to any person subject to the provisions of this Act, whether or not a corporation.

(c) Hearings authorized or required by this Act shall be conducted by the Secretary or such officer or employee as he may designate for the purpose. The findings of fact by the Secretary shall be conclusive if in accordance with law.

LIABILITY FOR PERSONAL INJURIES

SEC. 24. A right of action for damages shall accrue to any person for injury or death proximately caused by a violation of this Act.

SEPARABILITY CLAUSE

SEC. 25. If any provision of this Act is declared unconstitutional, or the applicability thereof to any person or circumstance is held invalid, the constitutionality of the remainder of the Act and the applicability thereof to other persons and circumstances shall not be affected thereby.

EFFECTIVE DATE AND REPEALS

SEC. 26. (a) This Act shall take effect six months after the date of approval. The Federal Food and Drugs Act of June 30, 1906, as amended (U.S.C., title 21, Secs. 1-15), shall remain in force until such effective date, and is hereby repealed effective upon such date: *Provided,* That upon the approval of this Act and before its effective date the Secretary is authorized to conduct hearings and to promulgate regulations, definitions and standards under the provisions hereof which shall become effective on or after the effective date of this Act, as the Secretary shall direct.

(b) The provisions of this Act shall not be held to modify or repeal but shall be held in addition to the provisions of the following Acts, as amended: The Tea Import Act, approved March 2, 1897 (U.S.C., title 21, Secs. 151-158); the United States Grain Standards Act, approved Aug. 11, 1916 (U.S.C., title 7, Secs. 70-87); the Insecticide Act, approved April 26, 1910 (U.S.C., title 7, Secs. 121-134); the Import Milk Act approved Feb. 13, 1927 (U.S.C., title 21, Secs. 141-149); the Caustic Poison Act, approved March 4, 1927 (U.S.C., title 15, Secs. 401-411); the Virus, Serum, Toxin and Anti-Toxin Act, approved July 1, 1902 (U.S.C., title 42, Secs. 141-148).